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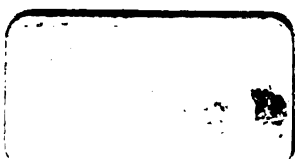
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American Medicine

A WEEKLY JOURNAL
FOUNDED, OWNED, AND CONTROLLED BY
THE MEDICAL PROFESSION OF AMERICA

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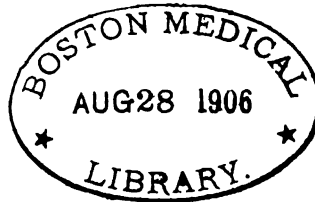
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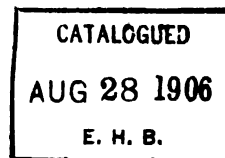


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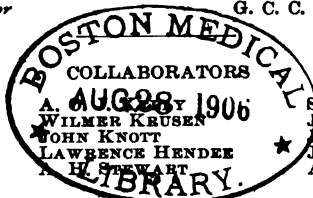
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The code of medical ethics almost invariably evokes lay comment of a flippant tone and there is a general tendency to look upon it as something designed for the good of the doctors and not for that of the patient. To a nation honeycombed with trade unions it savors of nothing but unionism. It is not known that the code has notoriously failed to accomplish any of the purposes of modern industrial combinations—and quite naturally failed too, because it was originally designed in ancient times and has survived to the present age for an entirely different purpose—the good of the patient. It is altruistic in the extreme and though it is a growth from ancient Greece, it is essentially Christian in spirit and practice. It originated long ages before unionism was even a dream. The egoistic purposes of union are more evident in the modern growth of medical organizations, but even here the old altruism permeates the whole structure, for there is scarcely a subject taken up by medical organizations which has not a direct bearing upon the public weal. Physicians are at last learning that they can best accomplish the purposes of their existence by combinations with their fellows and not by feeble individual efforts—indeed, each one is made a stronger unit by the help of others even if he has an individual task, whether for attack or defense.

The code is a system designed for physicians who are without organization, each unit wholly independent of all others. They required rules of conduct, for they had no organization to discipline them for improprieties which would injure the sick. It is not at all unlikely that fear of losing caste in the future organization which is bound to come, will bring about a better attitude to the sick than even the code, but that code must of necessity be the basis of all coordination. In the meantime it is in order to resent the imputation of extreme selfishness of a code, every one of whose rules is especially designed to guard a helpless sufferer from a thoughtless word or

action on the part of consultants. It is a time when a hint or unguarded action may cause intense suffering if not worse. It is bad enough to consider it a mere collection of rules for social amenities, but most ungracious to look upon it in the light of rules for walking delegates. It must be a low fellow, indeed, who cannot see the altruistic beauty of a code which is hoary, merely because it is good, yet a word of explanation now and then would, no doubt, prevent the sorry exhibitions of harmful criticism due to ignorance.

Posing and Respectability as Medical Ideals.—

For years those Britishers who are seriously concerned about anything have been most alarmed at the self-satisfaction, the asleep-and-dreaming indifference of the typical Englishman to the inefficiency and unideality of the nation. If the smiling cynics arouse themselves sufficiently to make an answer to the remonstrances of those who have not eaten of the lotus of success and complacency, that answer is a lisped *laissez-faire*. "Milton! Thou shouldst be living at this hour!" has no warning for them. How is it with medicine? The yearly spectacle of pitiable addresses in medicine, introductory lectures, banquets, dinners, and receptions, of which the medical journals give monotonous and endless evidences, shows that the profession also "takes the tint and tone-color from him who dreams the dream." For half a lifetime to hunt down honorary degrees, to slip softly into the "gig of respectability," to be at last one of the elite, to pose, to repose, and then to pose again, to smile with uplifted eyebrows upon all serious endeavors that do not flatter the paralytic Zeitgeist, to maunder and meander aimlessly, and with sapient superficiality, over old historic heroes, and "battles long ago," to ignore except with safe and glittering generalities, the living problems and realities of disease and suffering—all this is a deft way of traveling a broad smooth road marked with such strange signs as, "*Made in Germany!*" or "*Imported from America!*"

Economic methods of eating are so important and so axiomatic that it really occasions some surprise that more is not known about the matter. Mr. Horace Fletcher, in his famous A. B. Z. books on nutrition, very wisely insists upon the necessity of slow mastication with abundant insalivation. It is really astonishing how badly people use the teeth nature gave them for this purpose. Children naturally bolt their food, so it is said, and adults retain the habit. Not having the digestive power of cats or dogs, which naturally bolt their food, it results that much of our food is undigested and wasted. At the very time that Mr. Robert Hunter in his great work on "Poverty" is calling attention to the fact that 10,000,000 Americans are underfed, Professor Chittenden is apparently proving that little is needed. Surely, something in the way of teaching these 10,000,000 how to utilize what they now waste is bound to lessen our annual sick list. The profession can well thank Mr. Fletcher for the great interest he is taking in these dietetic matters. It was due to his initiative and substantial encouragement that the Yale experiments were carried out and medical science has been the gainer, even if it be subsequently proved that Chittenden has placed our needs too low. The stimulus given to the study of dietetics is the great gain, both for laity and profession.

The great black plague is a new title which has been suggested for venereal disease, and is designed to call attention to the enormous number of cases which yearly arise, and the consequent destruction of health and life. It is said that of the 770,000 male Americans who reach early maturity every year, 60%—nearly a half million—will become infected before they are 30. Many of these men marry before they are cured, and the infection of wives follows, causing 80% of deaths from female inflammatory troubles, 50% of gynecologic operations, and 80% of infantile blindness. As 20% of all women are infected, may one accept the statement that, in the aggregate, virtuous wives have more venereal disease than professional prostitutes, although we know that, practically, all prostitutes are infected? Nature is fully competent to put an end to this sad state of affairs in her own way and at her leisure. She simply destroys the most susceptible, so that in time either the disease will become mild through partial immunity, or there will be no men left who tend to consort with prostitutes. There is a suspicion that such racial immunity has already progressed quite a distance, for there is considerable evidence that in normal healthy men, gonorrhea is a self-limited disease, which terminates in spite of the treatment, or lack of it. In the weak and abnormal it

persists, and defies treatment. Among the Japanese and Malays the process has apparently gone still further, for it is said that the disease is mild, as a rule, and receives but little attention. Yet this natural method, so appropriate for lower cultures, is not suitable for civilized environments in which the nonimmunes are surviving if they know how. The process is, therefore, much slower and, indeed, the susceptible will probably survive for all time, for they are the fittest if they have enough intelligence and can be taught to use it. The trend of civilization seems to be in the direction of restricting the social evil by elimination of its devotees.

The Society of Sanitary and Moral Prophylaxis, recently organized in New York, is the last of the innumerable efforts which have been made to restrict the evils of prostitution, and is one of the methods of the present crusade for the enlightenment of the young so that they may not do those things for which nature may have a death penalty. The sexual instruction of the students of high schools and universities is being taken up as a recognized part of the curriculum both here and in Europe, and is generally recognized as the best method for this limited class. A little pamphlet on venereal diseases and their prevention has been prepared by Prof. Pontoppidan, of the University of Copenhagen. It contains the five lectures he delivers to his students and it has become quite popular, an English translation having also been published in London. Yet the great mass of boys leave school years before it is possible to give them instruction which they can understand, and it is to reach them that the new society has been organized. It is admittedly a link between the public and the medical profession, who by the very nature of their work cannot enter into such advertising without doing more harm than good. The founders desire to break the policy of indifference which has always prevailed among laymen, yet they depend upon the initiative of physicians and must be furnished with data and literature which young men can understand. Valentine, of New York, has already prepared a suitable pamphlet on the boy's venereal peril. It is an elaboration of a paper read before the American Medical Association in 1903, and it has been extensively used. Until recently there has been no organized effort by the medical profession as a body. The New York Homeopathic Medical Society has initiated a movement in the proper direction, using as a basis an article by Holden, of Yonkers, on the physician's unpaid debt to youth—a title, by the way, which is most appropriate. If the medical profession cures and preserves the types which formerly perished, it is in duty bound to teach them how to avoid the dangers.

Exaggeration in popular literature is the one great fault of all the previous attempts to restrict venereal diseases and prostitution. It is difficult to prepare anything in this line without using many adjectives and those in the superlative, and they impart a hysterical tone which young men instantly detect and resent as of the old goody-goody, Sunday-school type, now happily disappearing from religious literature. Since the regular medical profession is honor bound to take up its share of this modern sociologic burden, it is proper that some official recognition should be given to the various efforts to improve the conditions we ourselves are perpetuating in obedience to natural law. The preparation of temperate descriptions of the evils of illicit sexual congress are, therefore part of our public duties. Exaggerations in the literature of the temperance crusade did much harm to a worthy cause, and the mistake must not be repeated. Young men will be roused to contempt of our advice if we tell them dreadful things of gonorrhea and syphilis, and they subsequently learn that many of those infected entirely recover, and that the sins of the fathers are not necessarily visited on the children to the third generation. Above all else, it is well to remember that we are dealing with a powerful instinct, the satisfaction of which will lead men to risk their lives. It is to be expected that they will take lesser risks. Moreover, the men we wish to reach are at the age of the most intense activity of the sexual system, and we cannot expect to do more than lessen an evil which is bound to exist for many generations. Nevertheless, this fact does not justify anything except commendation for this new crusade. The whole subject has been tabooed so long that it requires more moral courage than most of us possess, to tell all the truth. Yet there is reason to believe that an honest, open statement to young men of sense would do good.

The nervous diseases of school children are being studied more and more every year, and it is not too much to hope that eventually the causes will be discovered and removed, so that it will no longer be necessary as in the past to remove these poor unfortunates from school entirely. Meyer¹ is said to have found nervous diseases in 7% of the school children he studied, while of those who had not attended school, only 2.6% was afflicted. Though he is of the opinion that the school is merely one factor, and that the main cause is to be found in an inherited nervous instability of some sort, yet the results are nevertheless a severe indictment of European school methods. If it is really a fact that modern civilized children are born with nervous tissue

of finer fiber, and therefore more irritable than that found in more primitive cultural states, it is a condition to be given most serious consideration. We are no longer justified in arranging school work as though all the little ones were as phlegmatic as Indian babies. The natural environment of childhood is untrammelled freedom in the open air. The explosive shouts emitted as soon as a child is released from a session, prove that it has been under an exhausting restraint. Of course this fact has long been known by intelligent teachers who give their little charges numerous occasions to blow off steam, but it does seem that much more can be done than is done. If it is true that American children are of a more nervous type than those of northern Europe, we can expect to find a greater proportion of nervous diseases among them. It is said to be 10% in New York City if we include cases of bad mentality, and though the nervous affections alone are said to amount to but 1.2%, we are safe in assuming them to be much more numerous if we include the great class of "nervous" little bodies which should be out rolling in the sand instead of sitting bolt upright on a hard, uncomfortable bench. The present mania of the American mother to educate her babies long years before it is time, is merely one of the evil results of our system; and since it is not possible to convince her of the harm done by such confinement, the problem before the school authorities seems to be to make the first few years of school approximate, as nearly as discipline will permit, the rollicking natural life of the babies in their charge. After all, it will remain for Americans to show the European world that a big share of the "nervousness" and ill-health of school children is due to eyestrain, a truth as important as it is neglected.

Overtasking of school children has been made the subject of a report by Consul-General Guenther, of Frankfort, Germany. He quotes Dr. Otto Dornblueth, a neurologist of that city, who writes against the practice of afternoon sessions, and who states that an investigation of 16,000 children showed that sickness among those who attended school in the forenoon alone is one-third less than among those attending both sessions. He does not state the health conditions of those who do not go to school at all, but from other sources we can assume them to have been still better. Dornblueth asserts as a fact that afternoon sessions exhaust the children, disturb digestion and tire their brains. No doubt everyone's personal experience in their own childhood days confirms his statements. In spite of his opinions as to the exhaustion due to afternoon school he makes the astonishing proposition to have a morning session of five hours, a relaxation of 15 minutes being provided in

¹ Berliner klinische Wochenschrift, No. 17, 1905.

every hour. This, of course, is entirely too long a time to deprive young children of food, and even in our high schools it is known to be productive of much harm now and then, unless the scholars are able to get a nourishing lunch at noon instead of the usual sweet bun and bit of candy. To supply some hot thick soup with bread and milk may smack of socialism, but might so strengthen the poor bodies as to lead to better scholarship. It is a plan which is being seriously considered in many parts of the world. For the youngest children a morning session of three hours seems more reasonable, and to overcome the objections of the mothers who want the State to look after their children in the afternoons because they cannot do it themselves, Dornblueth suggests the establishment of retreats where the little ones can be under proper nurses—a plan which is in actual practice in one of our western States. Though it sounds socialistic it is physiologic. It at least emphasizes the fact that in the lower grades our schools are custodial nurseries anyhow, where these mere babies learn good English by imitation.

The dangers of excessive home work have been so long known, and the system has been so widely abandoned in the best American schools, that it is somewhat of a surprise to find the matter under discussion in English journals. A parent complains in a London daily paper that his child is given on Friday evening enough work to occupy all of Saturday and some of Sunday, too. The journal replied that hard work was necessary in a competitive world, and seemed utterly oblivious of the fact that such early strains were the best means of injuring a child so that it could not take up its future struggle for existence. The *Hospital*, of London, commented editorially upon this matter in a most wholesome way, but it seems rather primitive to American pedagogs, who have settled such matters long ago—theoretically, at least, if not practically. It says, "even the most thick-headed can recognize the folly of a system which enables a boy to come out first in a competitive examination at 14 years of age and qualifies him for a lunatic asylum at 40." The subject should be harped upon in this country, too, lest we forget. Prize scholars are not necessarily or even generally the successes in life—indeed, we have so many vigorous "self-made" men, whose vitality and energy is the result of normal development out of school, that the question naturally arises, why cannot we have more of such types from the schools? It seems almost heresy to say anything against the public school system—indeed, it is heresy to decry it as a system—but its defects, which are really being remedied as fast as they are discovered, are producing a distinct feeling of uneasiness in the minds

of many thoughtful writers, and are dilated upon by its enemies. It is wisdom, then, to lessen the nerve strains of every description in this early period when strains are so disastrous, to the end that children in school will eventually be found to be as healthy and strong as those deprived of its vital advantages.

Proposed London Sanatoriums for the Working Classes.—A meeting was recently held in London, November 18, 1905, in support of a general scheme for the provision and maintenance of sanatoriums for tuberculous patients of the working classes. The meeting pretty surely inaugurated a new era of progress in the prevention and treatment of "the great white plague." All classes of society were represented: Royalty by Princess Christian, of Schleswig-Holstein; either House of Parliament by some of its most prominent members, the Church of England by a member of the Episcopal bench, municipal government by its authoritative officials, and the "aristocracy of labor" by hundreds of delegates from the friendly societies and great trade unions. Much—and very excellent—advice was conveyed to the audience by the speakers. It was pointed out that the question of the prevention and cure of pulmonary tuberculosis was before all things a working-class question; that it affected the working classes more vitally than any other in the whole community. Recent elaborate investigations made throughout a considerable proportion of the area of the French Republic have conclusively demonstrated that tuberculosis is the direct outcome of the economic conditions of the people; that its prevalence is always in inverse ratio to the income of the affected classes; and that the most potent factors in its production are the conditions which at present seem to be inseparable from modern industrial life. The manifestations of the disease were always found in direct relation with bad air, bad food, small wages, long hours, and unemployment. In London alone, from 7,000 to 8,000 persons died annually of pulmonary tuberculosis, and it was estimated that about 80,000 were suffering from some form of tuberculosis. To this enormous sum of sickness and death, the heaviest contribution by far was, of course, that furnished by the working classes. The annual loss in wage-earning due to the ravages of this disease was estimated at £4,000,000 in the English metropolis alone! Of the Ancient Order of Foresters, the returns showed that pulmonary tuberculosis was responsible for 15 of every 100 deaths which occurred. In fact, the tuberculous plague is the great tax which is paid by the workers for the maintenance of the present industrial system. Encouraging accounts were given of sanatorium treatment, and special emphasis was duly laid on the great importance of prevention. It was proposed to build a sana-

torium now—without palatial pretensions—which would then be under the control of the working classes themselves. The want of sufficient accommodation up to the present was but too obvious; hundreds were looking for admission and waits of 20 weeks were of quite common occurrence. During that interval the disease often passed from the curable into the incurable stage. Such is the state of things which cries to Heaven for relief—also to terrestrial governments and financial and municipal benevolence—in London as in other great (and, as a necessary consequence) overcrowded cities. We trust, in the interest of humanity, that the London movement may soon become cosmopolitan.

Scholarship Demanded and Illustrated.—"What have we to do with abroad?" asked a remarkable political economist, and perhaps some Americans may feel as he in regard to their educational institutions. If some of our exalted English critics would take up certain of our real philologic abuses instead of gibing at "American linguistics," they could make us blush a deeper tint than we have heretofore been forced to show. How we stand with "abroad" is, nevertheless, of some importance, although of less than how we stand with ourselves. A medical college in a large city of the United States sends out its "annual announcement," in which the kite-tails of literary and scientific degrees appended to the names of the faculty would seem heavy enough to prevent any rise of the kites in the higher atmosphere of indefiniteness and ignorance. This assurance is increased by the warning to students solemnly laid down that "any mistakes in clearness and accuracy of expression will be regarded as serious defects relative to spelling and grammar, or any lack of neatness in penmanship." In the face of this stern condition, most slipshod in its own English, what must the students think, who, looking over the circular, find scarcely a grammatical sentence in it? What kind of a department is a "Linguist Department," and what does a "Professor of Linguistal" teach? *Micro*, *Medico*, *Genito*, *Gyn*, (for gynecology), etc., are printed as separate words, and the use of the punctuation box is the strangest ever seen in a printing office. As to spelling, the following words are illustrative: *propedentic*, *siceology* (because the students are mostly ladies?), *hermenentics*, *platis*, *abdominal palpitation* (for *palpation*), *pelvinetry*, *litholomy*, *batteriology*, *vernereul*, *papier-machi models*, *etiolog*, *abdoman*, *ostrology*, *Van diseases*, etc. The professors give "instructions," always, for instance, "on the functions important in practical medicine," and all animals used "are subsequently autopsied." Among others, the following textbooks are recommended:

Physiology.—Foster Stewart.
Therapeutics.—Woods.
Diagnosis.—Dacosta.
Surgery.—Dacosta, Walsham, Warren's Surgical.
Eye.—Swangy, Eye, Ear, Nose and Throat.
Genito, Urinary and Vernereul.—McReck Skin McReck Van Diseases.
Nervous Diseases.—Danna.

A serious purpose underlay the formation of the institution, incorporated as "A Religious and Divine Healing Association"; therefore one must as sincerely suggest only the best meant criticisms. All of us have an interest in the dignity and educational standards of our medical colleges. Nor do we see the least reason why theology and religion should not be conjoined with medicine in educational work, as in this, "The Medical and Surgical School of Christ's Institution." The circular speaks feelingly of the far traveling accomplished "by the aid and assistance" "of our Lord and Saviour Jesus Christ"; of its combination of "preaching the Gospel to sin-sick souls, and healing those who were afflicted with many diseases in the Name of the Lord." The faculty speaks of itself as "consisting of men of infused energy and hence by the help of the Almighty and the patronage of general public, development is sure."

BOOK REVIEWS

A Compend of Histology.—By HENRY E. RADASCH, M.S., M.D. Philadelphia: P. Blakiston's Son & Co., 1905.

This latest addition to the Quiz-Compends contains 286 pages of text and 98 illustrations. The first 27 pages are devoted to technic and then follow in order descriptions of the various tissues and organs. The question-and-answer style is wisely omitted, the descriptions being given in direct, sequential statements, which are unusually clear; for this reason the student should find little difficulty in comprehending the structure of even the most complex organs. The book is a helpful laboratory guide and presents but few points for criticism. More careful attention to grammatic details would improve many sentences. We are unaware of authority for calling polymorphonuclear leukocytes eosinophils, or even finely granular eosinophils, either of which may be intended.

Obstetric and Gynecologic Nursing.—By EDWARD P. DAVIS, A.M., M.D. Second edition, revised. Philadelphia, New York, London: W. B. Saunders & Co., 1904.

Any book written by the facile pen of Dr. Davis is destined, by reason of its lucidity and scientific accuracy, to secure readers. The experience of the author as a teacher of obstetrics to large classes of medical students makes a textbook prepared by him for the use of nurses particularly valuable in this profession. The relationship between obstetric and gynecologic nursing is so close that the two subjects can be conveniently treated together. This work has been prepared especially for the use of the training-schools of two of the large hos-

pitals of Philadelphia, and the nurse receives valuable advice as to the care of the mother during pregnancy, parturition and the puerperal state, and also as to the care of the child. Davis considers that the field of gynecologic nursing is narrow, as the majority of diseases among women are connected with pregnancy and parturition. The obstetric nurse fills a peculiar position and requires a special training which the ordinary surgical or medical nurse does not always receive; and we can recommend this book most highly as a textbook for training-schools for nurses, as well as an instructive volume for the practitioner of obstetrics. The style of the book is such that the mother herself may gain much useful information from it.

Obstetrics for Nurses.—By JOSEPH B. DELEE, M.D. Fully illustrated. Philadelphia, New York, London: W. B. Saunders & Co., 1904.

This volume is intended primarily for nurses, but medical students and practitioners will find in it much of value. It is the outgrowth of eight years of lectures to nurses in four different training-schools. Part one deals with the anatomy and physiology of the reproductive system; part second with nursing during labor and the puerperium; and part third, the pathology of pregnancy, labor, and the puerperium; while in the appendix, chapters are devoted to visiting nursing in obstetric practice, to the difference between hospital and home nursing, and to a complete dietary. The author dedicates the book "to the woman about to become a mother or with the newborn infant upon her bosom, wherever she has her tender burden," and certainly a strict observance of the lucid lessons here laid down will do much to diminish the morbidity and mortality among parturient women and newborn infants. Statistics show that of every 200 women who become pregnant at least one dies, and that 7% of the deaths of women between the ages of 20 and 40 years are due to puerperal infection. The trained nurse may do much to reduce this frightful mortality, and to decrease the number of women who seek relief from the injuries and diseases caused by pregnancy and parturition.

Radium and Radioactive Substances.—By CHARLES BASKERVILLE, Ph.D. Philadelphia: Williams, Brown & Earle, 1905.

The author of this excellent little book is head of the department of chemistry of the College of the City of New York. It is chiefly a review of the physical and chemic properties of radium and its allied products, but the last chapter deals with therapeutics. We thus have a concise and accurate exposition of what is known concerning radium and other radioactive substances, radioactive emanations, secondary radioactivity, the theory of radioactive phenomenon, and the physiologic action and therapeutic application of spontaneous radiation, and other forms of radiant energy. The illustrations are good and the recommendations conservative.

The Diagnostics of Internal Medicine.—By GLENTWORTH REEVE BUTLER. Second revised edition. New York and London: D. Appleton & Co., 1905.

The second edition of Butler's wellknown work on diagnosis appears in the same form as obtained in the previous edition with its several reprintings. It has been brought down to date without greatly increasing the size. The book has been very favorably received and this edition should increase its popularity. A new chapter on Diseases of the Mind, by Dr. W. A. White, and one on Medical Röntgen Ray Diagnosis by Dr. P. M. Pilcher, have been added.

Progressive Medicine.—Edited by HOBART AMOR HARE, assisted by H. R. M. LANDIS. Volume VII, No. 3. 1905. Lea Brothers & Co., Philadelphia and New York.

This issue of *Progressive Medicine* is made up of four reviews. William Ewart discusses Diseases of the Thorax and Its Viscera, including the Heart, Lung and Bloodvessels; William S. Gottheil, Dermatology and Syphilis; William G. Spiller, Diseases of the Nervous System; Richard C. Norris, Obstetrics. The names of these men are sufficient guarantee of the thorough consideration of their respective subjects. The present number appears especially rich in personal comments by the reviewers, as they combine the various references.

Handbook of Physiology.—By AUSTIN FLINT. New York: The Macmillan Company, 1905.

Dr. Flint presents this latest addition to his numerous writings on physiologic subjects for the purpose of connecting pure physiology with the physiology specially useful for physicians. It represents the instruction in physiology now given at Cornell, and treats the subject from a medical standpoint. Of the 850 pages of text, the last 100 are devoted to embryology. We do not know of another book on this subject which presents the material in a way so easily grasped by the student; the description of the cranial nerves particularly emphasizes this statement. Dr. Flint's long experience in teaching has shown him the needs of students and how to supply them. One statement should be corrected in subsequent editions, namely, that myelocytes form 3% of the leukocytes in normal blood. A prominent feature of the book is the atlas of colored plates, containing 48 figures, reproduced in the actual colors of stained microscopic specimens. These figures are excellent, and represent a new departure in books of this kind. The author and the publishers deserve great credit for their persistent efforts in perfecting these plates. We regard the book entirely worthy of commendation.

Vital Questions.—By HENRY DWIGHT CHAPIN, M.D. New York: T. Y. Crowell & Co., 1905.

This little book of 189 pages contains chapters on Inequality, The Unfit, Poverty, The Child, Health, Education, Success, Happiness, Religion, and Death. Parts of most of them have appeared in certain of the standard magazines, but even these have been greatly revised and changed. The author writes under the belief that the public may and can get from the medical profession much more than the mere healing of their physical ills. Those who read the sound statements contained in his book will certainly agree with him. The work should be read by physicians and then recommended to laymen.

Organotherapy or Treatment by Means of Preparations of Various Organs.—By H. BATTISTINI SHAW, M.D. (London), F.R.C.P. Chicago: W. T. Keener & Co., 1905.

This is an excellent and timely study of a very important subject. The physiology and pathology, the anatomy and chemistry of the various organs now used, the medicinal preparations, are carefully studied, and the therapeutic experiences and observations recorded with discrimination as well as comprehensiveness. We note a typographic error on page 152 in the citation of the recommendation to use epinephrin (suprarenal) in asthma, which was originally published in the Department of Treatment of *American Medicine*. The dose from 1.6 mg. to 6 mg. ($\frac{1}{10}$ gr. to $\frac{1}{10}$ gr.) and not 0.09 gr. (1½ gr.) as stated in this book.

Clinical Methods.—By ROBERT HUTCHISON, M.D., F.R.C.P., and HARRY RAINY, M.A., F.R.C.P. (Ed.), F.R.S.E. Chicago: W. T. Keener & Co., 1905.

The authors of this volume describe those methods of clinical investigation which aid us in arriving at a correct diagnosis. The first chapter deals with the methods of case-taking in general, and includes a general scheme for the investigation of medical cases. The rest of the book is really an expansion of that scheme, each system being taken up separately, and the methods of investigating it described in detail. A special chapter is devoted to the clinical methods of examining children. A chapter is given on the examination of pathologic fluids and in this, the ninth edition, the chapter on clinical bacteriology has been revised and in parts wholly rewritten. The book is thoroughly up to date, and will be useful to practitioners who wish to make themselves acquainted with the latest methods of clinical investigation.

Diabetes Mellitus.—By PROF. DR. CARL VON NOORDEN. Translated by FLORENCE BUCHANAN and I. WALKER HALL, M.D. New York: E. B. Treat & Co., 1905.

This monograph of 211 pages is Part VII of Dr. von Noorden's treatises on the Disorders of Metabolism and Nutrition and contains the lectures recently delivered in the University and Bellevue Hospital Medical College, New York, under the Herter lectureship foundation. The 6 chapter-subjects are Definition, Pathogenesis of Glycosuria, The Acetone Bodies, Other Changes in Metabolism in Diabetes, General Course and Prognosis in Diabetes, and The Treatment of Diabetes. In an appendix are furnished several food tables. This book can safely be styled the most enlightening and authoritative of the recent discussions on this difficult problem in nutrition. Dr. von Noorden gives at length the views of others, but, as in all his writings, he states positively his own convictions. The 50 pages devoted to treatment are well worth the price of the book.

Hygiene and Public Health.—A Manual for Students of Medicine and Health Officers. By B. ARTHUR WHITELEGGE, C.B., M.D., B.Sc. (London), F.R.C.P., D.P.H., and GEORGE NEWMAN, M.D., D.P.H., F.R.S.E. Tenth edition, revised and enlarged. W. T. Keener & Co., Chicago, 1905.

This small compact volume, so excellently written, deals with a large number of diversified subjects in a very clear and concise manner. The subjects treated are not only those ordinarily found in books on hygiene, but also include a discussion of the communicable diseases, instructions to health officers and the health laws of Great Britain. Although written for English health officers, the American health officer will find much in this Manual to admire in the clear-cut and concise English methods in dealing with communicable diseases. The nine previous editions of this popular book have been exhausted in 15 years. There will be a demand in the United States for this work on account of our increased interest in public health work.

The Principles and Practice of Medicine.—By WILLIAM OSLER. Sixth edition, thoroughly revised, from new plates. New York and London: D. Appleton & Co., 1905.

The present edition of this standard work contains 1,114 pages of text, but larger pages and new type allow of considerable increase of reading matter. The book is thoroughly abreast of the times and will fully sustain the popularity of the previous editions among all classes of

physicians. As in other editions, treatment receives the least consideration. We believe every reader of Dr. Osler's book would be better pleased if he embodied in it more of his own rich experience, both in diagnosis and treatment, though we know any extended discussion is precluded by lack of space. The physician who refers to the volume is sure to find information on any medical subject. A number of small errors should have been caught in the proof, as, for instance, the misspelling of Kartulis and ateleiosis on pages 2 and 774 respectively. On page 3 the maximum diameter of *Amoeba dysenteriae* is given as 20 microns instead of at least twice that size, as it should be.

A Textbook of Physiology.—By WILLIAM H. HOWELL. Philadelphia, New York, and London: W. B. Saunders & Co., 1905.

Of the recent additions to the list of textbooks on physiology this must be regarded as one of the very best. Both in its style and in the subject matter presented there is but little left to be desired. The author states that the necessary reduction in the vast amount of material at hand should, for the beginner, be made by the process of elimination rather than by condensation; the book is sufficient proof of the wisdom of this idea. It contains 886 pages with 271 illustrations, is well printed from clear type, discusses theories when they are an integral part of the knowledge of a subject, and in every way can be heartily recommended.

Lectures Upon the Principles of Surgery.—Delivered at the University of Michigan by CHARLES B. NANCRED, A.M., M.D., LL.D., with an appendix by WILLIAM A. SPITZLEY, A.B., M.D. Second edition. W. B. Saunders & Co., Philadelphia, New York, and London, 1905.

In the second edition the work has been brought down to date, a more modern terminology employed, and the latest ideas regarding leukocytes, especially with reference to the various anesthetics with their effects, have been incorporated. The work deals mainly with surgical pathology and diseases and is presented in such a clear form as to make the work of great value to students. The appendix by Dr. Spitzley, which is devoted entirely to the various theories that have been advanced for inflammation from ancient times to the present day, is interesting as well as instructive reading.

BOOKS RECEIVED.

[Prompt acknowledgment of books received will be made in this column, and from time to time critical reviews will be made of those of interest to our readers.]

Physicians' Account Book.—By J. J. TAYLOR, M.D. Medical Council, Philadelphia.

Manual of Pathology.—By W. M. LATE COPLIN, M.D., Professor of Pathology and Bacteriology, Jefferson Medical College, Philadelphia, etc. Fourth edition, rewritten and enlarged, with 495 illustrations, many of which are original, and 10 colored plates. P. Blakiston's Son & Co., 1905. Price, \$4.00 net.

Immunity in Infective Diseases.—By ÉLIE METCHNIKOFF, Foreign Member of the Royal Society of London, Professor at the Pasteur Institute, Paris. Translated from the French by FRANCIS G. BENNETT, Pathologic Department, University of Cambridge. Macmillan Company, New York, 1905. Price, \$5.25.

Surgical Aspects of Digestive Disorders.—By JAMES G. MUMFORD, M.D., Visiting Surgeon to Massachusetts General Hospital, etc., in association with ARTHUR K. STONE, M.D., Physician to Out-patients, Massachusetts General Hospital etc. Macmillan Company, New York, 1905. Price, \$2.50.

Anatomy and Physiology for Nurses.—By LEROY LEWIS M.D., Surgeon to and Lecturer on Anatomy and Physiology for Nurses at the Lewis Hospital, Bay City, Michigan. 12mo. of 312 pages, with 100 illustrations. W. B. Saunders & Co., Philadelphia and London, 1905. Cloth, \$1.75, net.

A Manual of Diseases of Infants and Children.—By JOHN RUHRÄH, M.D., Clinical Professor of Diseases of Children, College of Physicians and Surgeons, Baltimore. 12mo. volume of 404 pages, fully illustrated. W. B. Saunders & Co., Philadelphia and London, 1905. Flexible leather, \$2.00, net.

AMERICAN NEWS AND NOTES

GENERAL.

Relieved from Philippine Duty.—The Surgeon-General of the army is going over the list of officers of the medical corps who, during 1906, will be ordered to this country from the Philippines and Alaska, having completed the tour of duty of the prescribed duration of two years and six months, with a view to naming their successors.

American Dermatological Association.—At the twenty-ninth annual meeting held in New York city, December 28, 29, and 30, 1905, the following officers were elected for the ensuing year: President, Dr. M. B. Hartzell, of Philadelphia, Pa.; vice-president, Dr. Thomas C. Gilchrist, of Baltimore, M.D.; secretary and treasurer, Dr. Grover W. Wende, of Buffalo, N. Y. The next meeting of the Association will be held in Cleveland, Ohio, in May, 1906.

Personal.—A current rumor that Dr. Osler will give up the Regis professorship of medicine at Oxford to return to the Johns Hopkins is denied by his friends.—**Dr. Howard S. Anders**, of the Medico-Chirurgical College, gave an address recently before the Lebanon County Medical Society on "The Practical Relations of Certain Physical Signs to Prognosis and Treatment."—**Dr. E. L. Godfrey**, of Camden, N. J., one of the best-known surgeons in New Jersey, is critically ill with appendicitis in Pasadena, Cal., where he has gone for the benefit of his health, having been suffering from overwork. He is secretary of the State Board of Medical Examiners and Assistant Surgeon-General of the State National Guard.

Cholera at Manila.—There has been practically no cholera in the city of Manila during the past two weeks which could be correctly charged to the city itself. The cases reported have almost invariably occurred among persons who came from the provinces within 24 hours of the time they were taken ill with the disease. The situation in the provinces is not as encouraging as it might be. The number of towns infected is constantly growing and there is no longer a sufficient number of experienced medical men available to combat the disease at the numerous places at which it has made its appearance. The rainy season is now about over and the disease will probably not spread so rapidly, provided the streams can be kept free from cholera. Heretofore, in the towns in which cholera appeared, the health authorities have had the assistance of the community in stamping it out. The disease has now made its appearance in Cavite Province, where a large portion of the population refuses to believe that the disease is cholera and they render no assistance whatever to the health authorities. In consequence, the disease is spreading there much more rapidly than at other places.

EASTERN STATES.

A Hospital for Animals.—Among the new enterprises of Boston is the Commonwealth Hospital for Animals, which, within a few days, will take possession of its new building at 12 Cummington street, in the Back Bay district. As its name implies, the hospital is for the care and treatment of horses, dogs, cats, and household pets. It will include special sanitary features, baths, operating-room, kitchen, outdoor exercising paddocks, private wards, and a free clinic for animals of the poor on certain hours of the week. The hospital is controlled by a corporation, of which John I. Taylor is president and Samuel F. Wadsworth, M.D.V., a graduate of the Harvard Veterinary School, is managing director.

NEW YORK AND VICINITY.

An Epidemic Among Brooklyn Horses.—An unusual disease, which has caused the death of many horses in Brooklyn, is puzzling veterinary surgeons and

the Society for the Prevention of Cruelty to Animals in that borough. The disease seems to be epidemic in Williamsburgh, where 250 animals have been attacked fully 90% dying.

Doctors and Druggists at Odds.—The physician and druggists of Bayonne, N. J., are at odds over the question of counter prescribing, which the physicians say is too extensively indulged in by the druggists. The State law prohibits any but physicians from prescribing medicine. Counsel has been engaged by the druggists for a test in court.

Brooklyn's New Health Board Building.—The Department of Health will soon begin the erection of a new Board of Health building in Brooklyn. The building will be 184 ft. by 102 ft. by 115 ft. by 68 ft. in dimension. This will give approximately 10,000 sq. ft., of which space a half will be occupied by the offices, which will be separate from the general building. There will also be a separate clinic and isolation ward. The Board of Aldermen has appropriated \$295,000 for the purchase of the site.

Low Death Record for 1905.—Vital statistics for 1905 give New York City next to the lowest deathrate on record. The contagious disease deathrate is the lowest on record. In 1905 there were 103,852 births, against 99,555 in 1904, an increase of 4,297. There were 42,667 marriages, against 39,436 in 1904, an increase of 3,231. The deaths in 1905 were 73,450, against 78,060 in 1904, a decrease of 4,610. The deathrate per 1,000 of population in 1904 was 20.01, but this year it was reduced to 18.25. The real saving of life, considering births and deaths, was 7,042.

PHILADELPHIA, PENNSYLVANIA, ETC.

Camden Vital Statistics.—The following vital statistics for the year just ended are reported for Camden, N. J.: Births, 1,652; deaths, 1,402; marriages, 2,338. This is an increase of 469 marriages over that of last year. There was also an increase of over 800 births, and a decrease in the number of deaths by 130.

Orthopedic Hospital Trustees.—The annual meeting of contributors to the Philadelphia Orthopedic Hospital and Infirmary for Nervous Diseases took place last week, and the following managers were elected for three years: John W. Brock, Samuel V. Merrick, and Lawrence T. Paul.

Smallpox in Tamaqua.—Dr. Dixon, State Commissioner of Health, has received a message from Daniel Dechert, medical inspector for Schuylkill County, that twenty cases of smallpox had developed in Tamaqua in the last 48 hours.

Doctors Form a Union.—Physicians of Plymouth, Pa., are reported to have formed a union, fixed a schedule of fees, and agreed not to attend patients who are three months in arrears for professional services.

State of New Jersey Board of Medical Examiners.—Dr. William H. Shipps has been elected acting secretary of the State Board of Medical Examiners of New Jersey, vice Dr. E. L. B. Godfrey, secretary, who has been granted leave of absence until May, 1906. All communications should be addressed during this period to Dr. William H. Shipps, Bordentown, N. J.

Woman Physician for Girls' Home.—Dr. Mary DeHart, of Jersey City, has assumed her duties as medical director of the State Home for Girls, at Trenton succeeding Dr. George Parker, of Trenton.

New Beds for Almshouse.—Bids for 450 special beds for the patients at the Philadelphia Hospital have been received. They will be paid for out of an item of \$3,000 in the special appropriation by Councils.

Clinic on Scoliosis.—Dr. Robert W. Lovett, of Boston, assistant professor of orthopedic surgery at Harvard University, at his clinic at the Jefferson Medical College Hospital last week on "Curvature of the Spine," took the ground that many of these cases can be cured by proper gymnastics. He says that 33% of the children attending school are afflicted with this malady, and braces tend to weaken the muscle trouble rather than cure the malady. The clothing should be suspended either from the neck or from the hips, instead of from the shoulders. The first step to remedy the condition is to obtain mobility and improve the carriage of the patient; the next step is to retain the mobility. This, he concludes, can be obtained through the use of gymnastic machines. The exercises should be carried out for from four to five hours daily and throughout two years.

SOUTHERN STATES.

Yellow Fever Death in Galveston.—Patrick Fox, who was pronounced to be suffering from yellow fever, and who arrived at Galveston, Texas, from Cuba with his brother, died Monday.

Yellow Fever at Havana Mild.—Dr. Finlay, Chief of the Health Department of Havana, Cuba, says that Las Animas Hospital still contains three mild cases of yellow fever, but that they are all expected to recover. There have been no new cases.

The New Orleans Health Association.—The governing committee will present a resolution to Governor Blanchard, stating that it is the sense of the Association that the nomination for State health officer be made from the recommendations of the State Medical Society. It has also been proposed to erect a permanent isolation hospital to cost \$100,000.

New Army Hospital at Washington, D. C.—Plans have been accepted by Secretary Taft. A limit of \$300,000 for the cost of the building was fixed by Congress. Majors William C. Borden and W. D. McCall, of the medical department, and Major Thomas Slavens, of the quartermaster's department, compose the board that was appointed to consider plans.

Mortuary Report for New Orleans.—General diseases 30, diseases of the nervous system and organs of sense 18, diseases of the circulatory system 16, diseases of the respiratory system 19, diseases of the digestive system 14, diseases of the genitourinary system 14, puerperal diseases 2, diseases of the skin and cellular tissue 1, malformations 4, of infancy 3, old age 5, external causes 9. Deaths—White 63, colored 67; total white and colored, 135. Deaths in hospitals and other institutions 39, deaths certified by the coroner 18, deathrate per 1,000 per annum for the week ended Saturday, December 23, 1905, whites 14.79, colored 39.14; total white and colored, 21.60.

Scores Tuberculosis Theory.—Dr. D. F. Luckey, State Veterinarian for Missouri, expresses the opinion that tuberculosis is not hereditary with live stock. He bases his belief on the result of experiments covering a period of ten years. Dr. Luckey says he has recorded frequent cases in which both sires of a calf were in the last stages of tuberculosis, and yet an examination of the offspring by means of the tuberculin test showed it to be healthy and free from the germs of the disease. Owners of tuberculous cattle, he says, may breed them without fear of the offspring inheriting the disease. Dr. Luckey also has found that tuberculosis is highly contagious and that the introduction of one diseased animal into a herd may cause the entire number to contract the disease. His conclusions are directly opposed to the views of many veterinarians.

WESTERN STATES.

Doctors and Druggists.—Hostile petitions are being circulated in Iowa for signatures, and will later be presented as bills before the legislature. One has been drawn up by the physicians, and asks that pharmacists be restrained from counter prescribing, while the other is the work of pharmacists, and provides that physicians shall be prohibited from compounding prescriptions.

Chicago's Low Deathrate.—From present indications, the deathrate in Chicago for 1905 will be the lowest in the city's history. The lowest previous annual deathrate was 13.62 per 1,000 population, in 1904. The rate for 1905, if the low average continues this week, will be less than 13.5 per 1,000 population. There were 496 deaths reported last week, against 489 for the previous week and 548 the corresponding week of last year. The principal causes of death were: Pneumonia, 83; pulmonary tuberculosis, 63; Bright's disease, 45; heart diseases, 38; violence other than suicide, 27. There were 6 cases of suicide. In the loop district 36,293 pounds of flesh, fruit, and vegetables exposed for sale were condemned as unfit for food. At the stockyards the city health inspectors condemned 195,438 pounds of flesh as unfit for food, 5,024 pounds of which had passed government inspection.

CANADA.

Smallpox Epidemic.—The health officer of Melancthon, Dufferin county, reports that up to Thursday last 84 cases of smallpox had developed in the township. Of these 50 have fully recovered. He says the disease was allowed to spread as it was taken for chickenpox at first. Speaking to the provincial board of health, Dr. Sheard, of Toronto, repeated the opinion already expressed: "I am quite certain we are going to have an epidemic of smallpox throughout the province. I don't care who the medical health officer may be, he will have to meet the situation. We are going to have a large number of cases, and the situation will become serious. It is a question whether we should not have everybody vaccinated."

FOREIGN NEWS AND NOTES

GENERAL.

Environment and Criminality.—Professor Terriani says that 80% of the child criminals of Italy are manufactured by bad environment and inadequate education—in other words, by preventable causes; that 30% of the criminals of the country are minors, and of these, 85% are thieves.

Malta Fever.—The many Americans who visit the countries of the Mediterranean will be interested in the results of a scientific investigation of the so-called Malta fever, prevalent in the countries adjoining the Mediterranean sea. The Royal Society of England recently sent a commission of scientists to countries bordering the Mediterranean sea to investigate the causes of the so-called Malta fever. They have reported that the disease is probably transmitted to human beings by domestic animals, especially goats. The examination of the blood of goats showed a plain reaction with reference to Malta fever, and a close examination of eight different flocks of goats had the result to demonstrate that about one-half of the number showed this suspicious condition. It was even found that some apparently healthy goats secreted the bacilli of the Malta fever in their milk in large quantities. It is, therefore, very probable that the consumption of goat milk transmits the disease to human beings. This conclusion is supported by the fact that at Gibraltar, where Malta fever is very common, the milk consumed is almost exclusively goat milk.

OBITUARIES.

Benjamin W. Taylor, aged 72, December 27, from pneumonia, at his home in Columbia, S. C. He was graduated from the medical college of the State of South Carolina, Charleston, S. C., in 1858. During the Civil war he served as colonel in the Confederate service, and was chief surgeon in Charleston Harbor at the fall of Fort Sumter. He was a member of the Southern Surgical and Gynecological Association, Association of National Railway Surgeons, and the American Medical Association.

Thomas Y. Aby, aged 65, December 24, from paralysis, at his home in Quarantine, La. He was graduated from Tulane University of Louisiana medical department in 1866. He had served as surgeon at the quarantine station since 1884. At the outbreak of the Spanish war he offered his services, and was appointed acting surgeon to the Twentieth Infantry and was with the regiment at the battle of Santiago.

James L. Harrima, December 21, at his home in Hudson, Mass. He was graduated from the Medical School of Maine, Bowdoin College, Brunswick, Me., in 1857. He was a Grand Army man and prominent in Masonic circles.

T. P. Coleman, December 26, as the result of injuries sustained in a railroad wreck, at his home in Oxford, Miss. He was graduated from the University of Pennsylvania, department of medicine, in 1859.

George W. Doane, aged 81, December 20, at his home in Hyannis, Mass. He was graduated from Harvard University Medical School, Boston, in 1844, and had been in active practice for over 60 years.

John Warner, aged 86, December 21, suddenly, at his home in Clinton, Ill. He served as a major in the Civil war, and since then has been devoting his time to banking business.

Martin Lauber, aged 69, December 24, at his home in West Earl, Pa. During the Civil war he served as surgeon in the navy.

John McClellan, aged 97, December 19, at his home in Woodstock, Conn. He was graduated from Yale University in 1833.

THE PUBLIC SERVICE

Changes in the Medical Corps of the U. S. Army for the week ended December 30, 1905:

Major **FRANCIS A. WINTER**, surgeon, will report at Zamboanga, Mindanao, for duty.—First Lieutenant **WILLIAM A. DUNCAN**, assistant surgeon, will proceed to Cotabato, Mindanao, for duty, relieving First Lieutenant **Edward B. Vedder**, assistant surgeon, who will proceed to Camp Keithley, Mindanao, for duty.—First Lieutenant **WILLIAM R. DAVIS**, assistant surgeon, will proceed to Camp Eldridge, Laguna, for duty.—**ULYSSES G. DONSTON**, sergeant first class, Whipple Barracks, will be sent to Manila, P. I., on the transport leaving San Francisco, Cal., about January 5.—Captain **ELMER A. DEAN**, assistant surgeon, is granted leave for three months from about January 1.—**EDWARD R. MURPHY**, sergeant first class, general hospital, Fort Bayard, will be sent to Manila, P. I., on the transport leaving San Francisco, Cal., about January 5.—**HARRY M. JENNINGS**, sergeant first class, general hospital, Fort Bayard, will be sent to Fort D. A. Russell for duty.—Major **FREDERICK P. REYNOLDS**, surgeon, is granted leave for one month from about February 1.—Second Lieutenant **CHARLES S. BLAKELY**, is granted leave for ten days from about December 23.—First Lieutenant **EDGAR W. MILLER**, assistant surgeon, leave granted for ten days is extended twenty days.—**GEORGE F. CAMP-**

BELL, sergeant first class, Fort D. A. Russell, will be discharged under the provisions of G. O. 48, W. D., March 15, 1904.—First Lieutenant **HARRY S. PURNELL**, assistant surgeon, is granted leave for one month and ten days with permission to visit China and Japan, effective about December 15.—So much of orders as directs First Lieutenant **HARRY S. PURNELL**, assistant surgeon, to proceed to the United States on the transport scheduled to sail about January 15, is amended so as to direct him to proceed on the transport scheduled to sail about January 5.—So much of orders as directs First Lieutenant **LOUIS C. DUNCAN**, assistant surgeon, to proceed to the United States on the transport scheduled about December 15, is amended so as to direct him to proceed on the transport scheduled about April 15.—First Lieutenant **SAMUEL E. LAMBERT**, assistant surgeon, is granted leave for three months, upon being relieved from duty in this division December 15, with permission to return to the United States via Europe.—First Lieutenant **CHARLES F. MORSE**, assistant surgeon, is granted leave for three months, upon being relieved from duty in this division December 15, with permission to return to the United States via Europe.—First Lieutenant **WILLIAM P. BANTA**, assistant surgeon, is relieved from duty in the department of the Visayas, and will proceed to Manila, reporting to the commanding general, department of Luzon, for duty.—First Lieutenant **CARY A. SNODDY**, assistant surgeon, is granted leave for one month, with permission to visit China and Japan, effective about December 15.—Captain **CLARENCE J. MANLY**, assistant surgeon, leave granted December 5 is extended one month.

Changes in the Public Health and Marine-Hospital Service for the week ended December 27, 1905:

S. B. GRUBBS, passed assistant surgeon, granted seven days' leave of absence from December 22, 1905, under paragraph 191 of the regulations.—**M. H. FOSTER**, passed assistant surgeon, relieved from duty at San Diego, Cal., and temporary duty at Galveston, Texas, and directed to proceed to San Juan, P. R., assuming the duties of chief quarantine officer.—**EDWARD FRANCIS**, passed assistant surgeon, granted leave of absence for one month from January 17, 1906.—**B. J. LLOYD**, assistant surgeon, directed to proceed to Guayaquil, Ecuador, and relieve Acting Assistant Surgeon **Luis F. Cornejo-Gomez**.—**J. H. CASTLE**, chief of division of chemistry, hygienic laboratory, granted three days' leave of absence.—**A. L. GUSTETTER**, acting assistant surgeon, excused without pay for a period of twenty-five days from December 21, 1905.—**MALCOLM MCKAY**, pharmacist, granted leave of absence from December 13 to 31, inclusive.—**MATHIAS WALERIUS**, pharmacist, relieved from duty at Chicago, Ill., and directed to proceed to Memphis, Tenn., reporting to medical officer in command for duty and assignment to quarters.—**F. J. HERTY**, pharmacist, granted seven days' leave of absence from December 18, 1905, under paragraph 210 of the regulations.

Changes in the Medical Corps of the U. S. Navy for the week ended December 30, 1905:

R. K. McCLANAHAN, assistant surgeon, having been examined by a Retiring Board and found incapacitated for active service on account of disability, not the result of any incident of the service, is retired from active service on furlough pay from December 19, 1905, under the provisions of section 1454, revised statutes.—**B. H. DORSEY**, assistant surgeon, ordered to Altoona, Pa., January 2, for duty with recruiting party No. 4.—**H. W. JUDD**, acting assistant surgeon, detached from duty with naval recruiting party No. 3, ordered home and granted leave until expiration of appointment as acting assistant surgeon.—**E. E. CURTIS**, acting assistant surgeon, appointed acting assistant surgeon from December 21, 1905.

CLINICAL NOTES AND CORRESPONDENCE

(Communications are invited for this Department. The Editor is not responsible for the views advanced by any contributor.)

THE MARRIAGE OF THE TUBERCULOUS AND THE SIZE OF THE FAMILY IN THEIR BEARING ON THE TUBERCULOSIS PROBLEM.

BY

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of New York.

Associate Director of the Clinic for Pulmonary Diseases of the Health Department; Visiting Physician to the Riverside Sanatorium for Consumptives of the City of New York; Consulting Physician to the Sanatoriums at Gabriels, N. Y., Scranton, Pa., Binghamton, N. Y., etc.

On December 16 there appeared simultaneously in *American Medicine* and the *New York Medical Journal* two remarkable editorials, one entitled "The Marriage of the Tuberculous and the Resistance to Tuberculosis" and the other "The Size of the Family." Both of these editorials should give much food for thought to all interested in the tuberculosis problem. They are filled with unusually courageous utterances and are so outspoken and full of common sense that it would seem that they should be read not only by all physicians but also by sociologists, reformers, and statesmen.

As a starting-point for the discussion of the above-mentioned subjects, I may be permitted to reproduce here a sentence or two from those editorials. The one in *American Medicine* says: "The marriage of the tuberculous is perhaps frowned upon by all physicians, the majority of whom would no doubt advocate the prohibition of such unions. It is considerable of a surprise, then, to learn that Dr. Charles Valentino, of Paris (*Revue Scientifique*, July 5, 1905), has declared these marriages are desirable." From the editorial in the *New York Medical Journal* I beg leave to quote the following: "Surely, among the thoughtless and improvident, the reproductive impulse is sufficiently imperative without ill-considered utterances tending to weaken the sense of parental responsibility, which at best is none too strong. The social worker in the tenements and the hospital physician will probably agree that there are greater and more real evils in life than celibacy or the small family."

That large families, particularly among the poor, do not tend to diminish but rather to increase the number of the tuberculous, I can prove by my own records, and this doubtlessly would be proved also by those of others if they have paid attention to the point at issue. It is invariably my custom when examining a patient to take down the family history, and one of the questions asked is "how many children were in your family?" and "were you born the first, second, third, etc.?" In the majority of cases, when there is a large family, it is the later or last born, the fifth, sixth, seventh, eighth, or ninth, who has contracted tuberculosis. This is to be explained, on the one hand, by physiologic reasons, the parents being in advanced life and less vigorous; on the other hand, by economic reasons, the later born children cannot, because of increased expense, receive the particular care and the good and ample nourishment which it was the privilege of the first ones to receive when the family was still small.

Have the often made statements that tuberculosis increases the desire for sexual intercourse and that the procreative power of the tuberculous is really increased, any foundation? I have known a number of patients who confessed to me that their sexual desire had become more intense than in their former healthy state. By a careful inquiry into the cause for this true or imaginary condition, I could almost invariably trace it to the following: The patients had abandoned all occupations, not only physical, but also mental, and their thoughts

dwelt upon sexual pleasures. Often in addition to this, the patient who formerly spent perhaps the greater part of his life occupied away from home, in workshop, office, or factory, has been compelled, owing to his infirmity, to remain constantly at home.

I believe, without entering any further into this subject, we may say that here, and here alone, are to be found the explanations of increased sexual desires and the supposed increased procreative faculty. I have often been able to remedy this real or imaginary desire by directing the patient's attention to sound literature, and light, healthful outdoor occupation. The absolute prescription of sexual intercourse to the tuberculous husband or wife will probably never be carried out, nor will tuberculous individuals always obey when we forbid them to enter the matrimonial state. Some marry without knowing that they are tuberculous; some, even though they know it, marry, no matter what the doctor says, and there is no law to prevent them from doing so.

Are we then justified to teach the tuberculous individual such preventive measures as to make the procreation of a predisposed race impossible? I think so; nay, I go even further in saying that I consider it the sacred duty of every physician to teach prevention, particularly when the wife is tuberculous. The life of a tuberculous woman is always endangered by pregnancy, and by prevention her own life will often be spared and she will have no occasion to transmit a tuberculous diathesis to an innocent child. I do not at all share the opinion of Valentino and some others who claim that tuberculous parents transmit to their children a natural immunity to tuberculous invasion. Twenty years of clinical work in tuberculosis has taught me rather the reverse, namely, that the physiologic poverty transmitted from tuberculous parents to a child rather invites a tuberculous invasion than confers an immunity, and I would not wish to consent to the procreation by tuberculous parents on this theory of immunity.

One need only to picture in one's mind the unsanitary, dark and overcrowded homes in our tenement house districts, or even in some country regions where many of the untrained tuberculous live, to fully realize the multiple sources of infection to which a child is exposed. These postnatal infections, formerly ascribed to direct parental transmission, often take place through inhalation, ingestion, and inoculation at the same time, because of the child's close contact with the pulmonary invalid. The numerous cases of scrofulosis (which is only a milder form of tuberculosis), of Pott's disease and other typical forms of joint and bone tuberculosis in children of tuberculous parents, would seem to me a strong evidence against the theory of transmitted immunity. A careful and unbiased study of the tuberculosis problem in its biologic, medical, and social aspects will probably bring every careful student to the same conclusion at which the distinguished editor of *American Medicine* arrived when, at the end of his editorial, he says: "We are not at all sure that Dr. Valentino will receive much support."

The French school, under the leadership of Grancher, has recently resorted to a new method of saving the children of tuberculous parents. They discard the theory of immunity entirely, being strongly convinced of the transmission of a physiologic poverty and the great danger of postnatal infection and place the children in hygienic and health-producing environments. "L'Oeuvre de Preservation de l'Enfance Contre la Tuberculose" has for its main object to remove children of tuberculous parents from the centers of infection, either to good sanitary country homes, or to sanatoriums, until they are strong enough to resist the invasion of tuberculous diseases. The removal of the children is, of course, always done with the consent of the parents. The first complete report was given out at the recent Tuberculosis Congress in Paris and showed most gratifying results.

Thus, it would seem rational to teach prevention first, which should be done by the physician who attends tuberculous parents. To the latter, their duties toward themselves and their fellowmen should be plainly set forth and no one can do this better than the family physician. Second, it would seem wise when in the presence of children of the tuberculous poor to resort rather to the social prophylaxis as pointed out to us by our French colleagues than to rely on a probable immunity transmitted from parental source.

The social aspect of the tuberculosis problem has of late roused more interest. Upon invitation I spoke last month on the social aspect of tuberculosis before the People's Forum in Yonkers, the Third Massachusetts State Conference of Charities, and the Laennec Society for the Study of Tuberculosis at Johns Hopkins University. All three of these addresses I concluded by expressing the following thought, which may also serve as a concluding paragraph to the discussion of the marriage of the tuberculous and the size of the family. I feel very strongly on this subject, but I know that there are many worthy men and women, inside and outside of the medical profession, who differ with me. However this may be, I am willing to take the responsibility before the law and my God for each time I have taught a tuberculous husband and wife not to procreate a race predisposed to tuberculosis; and with all due respect to the opinion of others, as a physician with, I may modestly claim, a somewhat large experience among the poor and poorest of the poor, the middle classes and also among the well-to-do, and as a student of sociology as well as of preventive medicine, I am not for quantity but for quality.

RUPTURE OF THORACIC ANEURYSM INTO PLEURAL CAVITY, SIMULATING PLEURITIC EFFUSION.

BY

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The following case seems of sufficient interest to report on account of its rarity and as showing the possibility of confusing blood in thorax with serous or purulent effusion:

Patient, J. D., colored, aged 41, nativity, Kentucky; admitted to the United States Marine Hospital Sanatorium at Fort Stanton, New Mexico, on January 2, 1905; transferred from Louisville, Ky. The records show the family history is good; that the patient had had syphilis several years ago, but that his general condition was good up to one year ago. Since that time he has several times required hospital treatment. He has had occasional hemorrhages from the lungs with slight rise of temperature. For several months after admission to this institution he continued to lose ground, and on July 10 began to complain of considerable pain in the left chest, with all the physical signs of effusion into the same side. His temperature varied from about 37° C. in the mornings to 38.5° C. in the afternoons. We at once used the aspirating needle at five different points at the base of the left lung, and were surprised at finding nothing. The patient continued to suffer severely both from pain and dyspnea, and on the evening of July 20 suddenly died.

The autopsy findings showed the entire left pleural cavity filled with dark clotted blood, which explained our failure to aspirate the pleural cavity. Incision into the left lung showed at the apex a cavity the size of a small orange completely filled with an aneurysmal sac, which had extended from the arch of the aorta. The aneurysmal sac contained layers of fibrinated blood. The pleural cavity was connected with the aneurysmal

sac through a small opening the size of a pencil point. The remainder of the left lung was infiltrated with tubercles. The heart and right lung were apparently normal.

LIGAMENTUM PHRENICOCOLICUM DEXTRUM.

BY

BYRON ROBINSON, M.D.,

of Chicago.

To the Editor of *American Medicine*:—I note in your issue of October 7, an abstract of Dr. Longyear's article on "A Study of the Etiology of Floating Kidney, with Suggestions Changing the Operative Technic of Nephropexy," in which he is quoted as saying that "Further investigation of the literature failed to enlighten the author as to the presence of any tendinous prolongation from the lower pole of the kidney." In an article on the cecum, published by me in the *St. Louis Courier of Medicine*, for October and December, 1902, I have mentioned the band he is trying to describe. I termed it the ligamentum phrenicocolicum dextrum, and said: "The ligamentum phrenicocolicum dextrum inserted into the right colon at the junction of its lower and middle thirds often retains the cecum in its usual locality, preventing its floating about or passing distally into the lesser pelvis." In the same article I also said: "The cecum is maintained in position by three peritoneal folds, viz., a, the ligamentum phrenicocolicum dextrum, a fold derived from the ligamentum hepatocolicoduodenale and ligamentum hepatorenale. This peritoneal fold has a wide influence in preventing the cecum from passing into the pelvis, and also in preventing the cecum from assuming the potential position—that is, wandering into the dangerous peritonitic region of the enteronic loops. In adult man the ligament appears to arise from the distal pole of the right kidney." This ligamentum phrenicocolicum is a colonic band, and the kidney is involved in it rather accidentally. I noted this band in hundreds of autopsies, and I consider it the counterpart of the ligamentum phrenicocolicum sinistrum.

AVOIDABLE NOISES.

BY

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of Chattanooga, Tenn.

To the Editor of *American Medicine*:—In the course of my efforts to obtain decent quiet for Chattanooga, the abatement of the evil of steam whistles seems of the utmost importance. Those who think as I do can be of great help to me in this crusade by getting their city authorities to enforce any laws they may have on the subject. For example, why not make Philadelphia a model for other towns and cities? The physicians can do it! The clergy have promised me their help and without doubt others can obtain assistance from the same source. Further, among the numerous departments of the American Civic Association (headquarters in Philadelphia) is one dealing with "Nuisances." The head of this department is Frederick Law Olmstead, of Brookline, Mass. Why not ask the assistance of this association? We could certainly furnish them with plentiful material for a pamphlet on "fool uproar." They have issued many illustrated papers on "City Beautiful" topics and are issuing "clipping sheets" for newspapers. I believe they will gladly lend a helping hand and as a member of the association I will not neglect to remind them of the sick and the babies.

If any reader of *American Medicine* can give me any information which will help the cause I would be exceedingly grateful.

ORIGINAL ARTICLES

PROGNOSIS IN TUBERCULOSIS.¹

BY

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of Philadelphia.

Prognosis in tuberculosis depends: (a) On the virulence of the tubercle bacillus; (b) on the dose; (c) on the resistance of the host; (d) on the coexistence of other microorganisms; (e) on the amount of tissue which has been destroyed; (f) on the duration of the disease; (g) on complications arising from toxemias; (h) on age; (i) on race; (j) on social condition; (k) on environment; (l) on financial resources; (m) on temperament; and (n) on character.

Variability in the virulence of the tubercle bacillus has been demonstrated in animals and may be inferred from observations on man. The virulence of the bacillus can be modified at will in the laboratory by variation in the culture medium or by selection of the animal for inoculation. The benign bacillus may be made more virulent in this way and the virulent bacillus may be made more benign, but modifications in either direction can only be made gradually. A bacillus which has attained virulency, however, gives intense toxemia, varying in degree to practically all animals which are not immune. Even when there is some immunity, such a bacillus will give a more intense toxemia than will a milder bacillus. This, then, leaves no doubt that there is a variation in the virulence of the bacillus independent of any variation which may exist in the soil.

Clinically, we likewise have some evidence of variation in virulence of the bacillus. Usually the first case in a family is more severe than those which follow. It is true this phenomenon may be interpreted in two ways, namely, in that the bacillus may become more benign as it goes from one member of a family to another, or that the soil may be modified gradually as members of the family resist implantation for a longer time. There probably is some truth in both views. A more striking phenomenon is the virulence of the bacillus in some families as compared with the benignancy of the bacillus in other families. Here again, however, the two interpretations are applicable.

There is no way of demonstrating in which view there is most truth, but it may reasonably be inferred from our present knowledge that there is variation in the virulence of the bacillus. For practical purposes in formulating a prognosis, we may well be influenced by the character of the case from which a given case has been derived.

The dose of the bacillus undoubtedly has a decided influence on the outcome of an attack of tuberculosis. In animals this has been proved. In man we have many observations which enforce conviction that it is so. When the dose is small the host is not only able to fight off the bacillus, but gradually gains in fighting qualities. When the dose is large, the toxemia seriously cripples

important organs of the body before the invaded organism can accommodate itself to the onslaught. This is the rule; there are exceptions. Under certain conditions which we do not yet understand the invaded organism staggers under the blow of a very large dose of tubercle bacilli, recovers itself, develops a strong immunity, and successfully throws off the disease. In this way in malignant cases of tuberculosis the subjects sometimes recover in a very short time. Ordinarily, when the dose is small, it is safe to give a favorable prognosis; when large, one should reserve his opinion until he can see what is going to take place.

Much undoubtedly depends upon the resistance of the host in the fight against tuberculosis. That there is great variation in the resistance of different individuals cannot be doubted. What constitutes this resistance is still a mooted question. It undoubtedly is a complex quality and perhaps may be due to different conditions in different individuals. We call it immunity, but this word does not convey all that is meant. Both the laboratory and the bedside give evidence of an active and a passive resistance. In the active resistance, the blood or the tissues manifest a fighting quality against the tubercle bacillus; in the passive resistance the tissues apparently do not furnish the proper nutrition for the bacillus, leading to its degeneration and death. Then there is immunity against the toxin of the bacillus without immunity against the bacillus itself, and on the other hand there is immunity against the bacillus without immunity against the toxin. Clinically we see this in cases in which the tubercle bacillus develops in a host and leads to extensive destruction of tissue without giving rise to any symptoms which attract attention on the one hand, and on the other cases in which the tubercle bacillus does not get a strong foothold and in which nevertheless there is intense toxemia. Again we may have immunity against the destructive powers of the bacillus and against its toxemia without immunity against its growth and development in the tissues. In such cases fibrosis takes place in the tissues instead of destruction and sometimes recovery follows and sometimes chronic invalidism. Immunity further may be distinguished as individual, family, and racial; and as innate and acquired. It is questionable whether individual immunity ever exists except when acquired. Family and racial immunity usually have been acquired over a long period of time. Families in which tuberculosis has existed for generations usually have considerable immunity and sometimes an absolute immunity. Races which have been fighting tuberculosis for a long period of time have much more immunity than newer races which have not fought the disease so long. In formulating a prognosis it is well to bear in mind all the sources of immunity which an individual may have. In proportion to the immunity the prognosis is favorable.

In man, in the white race at least, so long as tuberculosis remains uncomplicated, the tendency to recovery is greater than the tendency to a fatal termination. Unfortunately, however, many pathogenic microorganisms fraternize with the tubercle bacillus for destructive purposes.

¹ Read before the International Congress on Tuberculosis, in Paris, October, 1905.

The pneumococcus, the streptococcus, and the staphylococcus are well known confederates of the tubercle bacillus, and we have reason to believe that there are many others which we do not yet recognize. The pneumococcus in association with the tubercle bacillus gives rise to grave complications, which greatly depress the patient and seriously interfere with a successful fight against the disease. Studies recently made by Ravenel, Irwin, and myself seem to warrant the conclusion that the pneumococcus is perhaps the chief factor in hemoptysis. Streptococci and staphylococci not only lead to intense toxemia, but probably are closely associated with the breaking down of tissue. Sometimes the pneumococcus, streptococcus, and the staphylococcus are all three associated at one and the same time with the tubercle bacillus, and when this occurs the downward tendency of the patient is usually rapid. Mixed infection of any kind makes the prognosis in tuberculosis graver, and should be carefully considered before an opinion is given in any given case.

The amount of tissue which has already been destroyed in a given case of tuberculosis usually gives a very excellent basis to form a judgment as to the outcome of the case. When the destruction of tissue is so extensive as to make the physiologic action of the organ involved incompetent, an unfavorable prognosis as to the final issue should be given, even when the toxemia is mild. In such cases a favorable prognosis may be given as to the immediate future, provided the patient lives within the bounds of his physical capacity. A person with cavities in both lungs, and with the greater part of his lung tissue injured by fibrosis when he has good immunity against the toxemia of tuberculosis, may be restored to a condition of physical health and well-being, but not to a condition of physical activity. Such a person may remain relatively well for many years, provided he avoids all exertion and lives a careful life. When there is extensive involvement of tissue in one or both lungs, or in the lungs and in other organs of the body, all of recent development without destruction of tissue, the prognosis should be exceedingly guarded. These cases, by reason of their acuteness, sometimes eventuate in recovery, but more frequently prove fatal.

The duration of the disease in connection with the amount of tissue involved or destroyed gives a fair indication of what the outcome will be. When the disease has been of long standing, without much destruction of tissue or much fibrosis, the prognosis is favorable. In such cases the tendency to recovery is strong and has gone on for years without artificial aid. The condition may be recognized by healed lesions in perhaps both apices, a mild activity lower down in one lung, and partially obliterated pleura on one or both sides. When the disease is of long standing, with one or more dry cavities and fibroid tissues around them, even though there is an acute exacerbation going on, the prognosis may be looked upon as favorable. The exacerbation here usually does not mean much and will run itself out in a short time. Many people have tuberculosis for a lifetime, with exacerbations at intervals of six months, a year, or even several years, always recovering from the attacks, and between exacerbations usually are in

good health. Such cases rarely prove fatal. They are the chronic invalids, as a rule, who go through life following a fairly active career, but never entirely well. When the disease is of short duration, and there is much tissue involved, the prognosis is unfavorable.

Complications of various kinds gravely influence the prognosis in tuberculosis. The toxins of the tubercle bacillus and the toxins of the various microorganisms which fraternize with it often set up changes in important organs of the body which greatly cripple physiologic action and lessen the resisting power of the individual. Nephritis is probably the most frequent complication of tuberculosis contributing to a fatal termination. The penalty which the individual sometimes pays for his immunity is toxic nephritis. This has been demonstrated by experiments on animals. At the bedside we often see patients, after having made a fair recovery, die of nephritis. Indeed, one of the most frequent immediate causes of death in tuberculosis is nephritis. The urine should frequently be examined in all cases of tuberculosis of long standing, and when evidences of nephritis are found, the prognosis should be guarded. Pneumothorax is a serious complication in tuberculosis and always makes the prognosis grave. Empyema makes the prognosis unfavorable, but not necessarily grave. Pleuritic effusion and extensive adhesions of pleura aggravate the prognosis, but do not make it unfavorable. Dilated right heart sometimes contributes to a fatal termination. Enlargement of the thyroid gland, either due to toxemia or to direct tuberculous infiltration, makes the prognosis less favorable. Any complication, indeed, which interferes with the physiologic action of the body should be looked upon as an aggravating feature of the disease.

The age of the patient should be taken into consideration in formulating a prognosis. Young people and old people usually show a greater tendency to recovery than do people in the middle time of life. The young show the strongest tendency to recovery of all. Children under 15 readily recover when placed under proper treatment and in proper environments. The age at which the disease perhaps shows greatest virulence is between 15 and 35.

Race always should be considered when formulating a prognosis. Some races are much more prone to tuberculosis and have it in more malignant form than others. As a rule the races which have been longest exposed to the disease show the greatest resistance. Jews have a wonderful immunity against tuberculosis and show a strong tendency to recovery when afflicted. They have almost complete immunity against the toxemia, less against the destructive power, and least against the growth of the bacillus. For this reason Jews have a high morbidity and a low mortality from tuberculosis. The Latin and the Teutonic races also seem to have a fair immunity. The Celts and above all the newer races in the struggle against the disease, such as the Negro and the American Indian, manifest a strong susceptibility and have the disease in rather a virulent form. A possible explanation of the susceptibility of the Celt may be found in the historic fact that the Celt resisted the Roman invasion and the Romans in all probability

spread tuberculosis throughout Northern Europe. The Negro and the American Indian were free from tuberculosis until they came in contact with the white man and have only been subjected to the disease for a few hundred years. The American Indian has practically been exterminated by the disease and the Negro at the present time even in America has about twice the mortality of the white man. It is said that the African Negro is even more susceptible than the American Negro.

The social condition of the patient has some influence on the outcome of the disease. Married life in both sexes makes the prognosis less favorable. The mother of the family in particular has many difficulties in struggling against the disease which other people have not. Widowhood in both the male and the female sometimes has an unfavorable influence upon the outcome on account of the melancholy and moroseness which such a condition engenders. Widowhood in the female, moreover, often is associated with hardships and this makes the prognosis unfavorable.

The environment of the patient plays an important role in the prognosis of tuberculosis. When the conditions of life are good, pleasant, and conducive to happiness the chances of recovery are better than when these conditions are fraught with difficulties and are depressing. A bright, cheerful home, with plenty of sunlight, with good ventilation, good drainage, freedom from care and worry, affectionate, sympathetic relatives, friends, and associates, all contribute much to recovery. The healthfulness, cheerfulness, and good sanitary condition of the place of employment when the patient is employed likewise are conducive to recovery. On the other hand, in a gloomy, dark, damp, dreary home, in which there is bad ventilation and bad drainage and a filthy condition, with sorrow, care, and sickness ever present, with fault-finding, irritable, disagreeable relatives, friends, and associates, the disease is apt to have a constantly downward course. When to the fatigues of labor are added bad ventilation and bad sanitary conditions, disagreeable associates in the place of employment the course of the disease is likewise rapidly downward. In many cases, indeed, the surroundings of the patient in his home and in his place of occupation practically determine the course of the disease and this should always be carefully considered in giving a prognosis.

Much depends upon the financial resources of the patient. If he has ample means to purchase all that is necessary for his restoration to health and to provide for all his personal wants and the wants of those who are near and dear to him his chances of recovery are much better than when he lacks such means. Poverty is a powerful ally of the tubercle bacillus for destruction. For the very poor, recovery is difficult because they cannot keep up the mode of life which is necessary long enough. Even when people of this class are restored to physical health in sanatoriums the restoration usually is only temporary because the patients cannot keep up the proper life after leaving the sanatoriums. Many of the patients who recover in sanatoriums established for the poor relapse and die within a few years. Unless a patient can command the necessary resources for

recovery in his home and can afford to live a careful, easy life for years after health has been restored the prognosis should be very guarded. Improvement in the home of the patient gives a better basis for a favorable prognosis than improvement under any other conditions because it takes place under the mode of life which is necessary to maintain good health after it has been restored. A guarded prognosis should always be given in cases in which improvement takes place under conditions differing materially from the conditions of home life.

Temperament has some influence on the outcome of a case of tuberculosis. Patients who are sanguine and hopeful usually do better than patients of a lymphatic, despondent temperament. For one thing it is easier to get their cooperation and this means a great deal in the treatment of tuberculosis. A patient who always doubts, always looks upon the gloomy side of life, enters into every measure half-heartedly, rarely does well. He expects to do badly and he usually does as he expects. He balks at every little difficulty and usually balks at the time when his cooperation is of vital importance. A patient on the other hand who is determined to get well, who is always pleased with every little step of progress that he makes, who aims high and strives hard to accomplish his purpose, nearly always does well. Nothing is too hard for him and he is ever ready to make an extra effort when an emergency arises. He comes through difficulties, if not completely victorious at least without much damage. When he has upsets he does not go back quite so far as he had come forward and between the intervals of his upsets he always makes a spurt forward, thus making constant progress.

Character likewise plays some part in the struggle against tuberculosis. The patient of strong character has therein great protection against relapses and against exacerbations of the disease. You need but point out to him the dangers which he may encounter and he will avoid them. You say to him that he must live a very regular, even life, that he must deprive himself of many pleasures, that he must avoid all dissipations and he never flinches but lives up to all conditions that you lay down. He soon forms a habit of life which is not only conducive to recovery but to maintenance of health when once established. The result is that he gets well very easily and remains well when he has recovered. The patient of weak mercurial character, on the other hand, is constantly vacillating between what he ought to do and what he wants to do. Under the spur of fear he may do hard things for a while and live the life which is necessary for his recovery and well-being, but after he has made a fair recovery and begins to feel well he breaks loose from his anchorage and in a day or a week undoes all that he has done. He repents and again does well for a while but in due time again falls away. His progress toward recovery is constantly interrupted and if he is ever fortunate enough to regain his health it is merely a question of time when he will have a relapse. Both the temperament and the character should be carefully studied in every case before giving a prognosis.

In forecasting the future of a tuberculous subject the physician should weigh carefully all matters bearing

upon the case, and even then should be guarded in his opinion. He should bear in mind that the tendency is always toward recovery, but that there are many impediments in the way of recovery. Restoration to physical health is comparatively easy, but the establishment of a condition of absolute sterility from the tubercle bacillus is difficult. Relapses take place even after years of apparent perfect health. The price of permanent recovery is constant and eternal vigilance and the pursuit of that kind of life which is necessary for recovery. A person who has had tuberculosis should not consider himself free from the necessity of leading a careful life, no difference how long he may have been well. Prognosis should, therefore, always be guarded and conditional. We may assure the patient that he will be restored to physical health and will remain well so long as he takes proper care of himself, but we should impress it upon him that his good health will only continue so long as he does take good care of himself.

TUBERCULOSIS OF THE THORACIC DUCT AND ACUTE MILIARY TUBERCULOSIS.*

BY

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of Philadelphia.

(From the Ayer Clinical Laboratory, Pennsylvania Hospital.)

Tuberculosis of the thoracic duct has been recognized for over 100 years. In 1798 the condition was discovered accidentally by Astley Cooper,¹ who described the lesions quite accurately and moreover interpreted his findings correctly, inasmuch as he considered that the great lymphatic vessel was the seat of scrofulous disease. Among the early writers Andral² is also credited by some with having described the same condition, but his notes are so vague that the correctness of the assumption is doubtful. It was, however, Ponfick³ who really first drew special attention to thoracic duct tuberculosis and emphasized its connection with acute miliary tuberculosis, though he did not consider it as the cause of the generalized process. His original communications were made in 1877, and during the next year Weigert⁴ reported his cases of vein tuberculosis and announced his conception of the origin and pathogenesis of acute miliary tuberculosis. In 13 such cases he found foci of tuberculosis in the veins in 10 and of the thoracic duct in 2. From the nodules in the veins and in the thoracic duct he believed that the poison (this was prior to the discovery of the tubercle bacillus) was swept into the general circulation and thereby gave rise to the generalized acute process. According to Weigert, before a focus in a vein or lymph channel can be considered as the point of origin of the acute process at least four conditions must be fulfilled:

1. The tubercle in the wall of the vein or duct must be older than the miliary nodules scattered through the organs of the body.
2. The tubercle must be situated in a vein or large lymph vessel which is patent.

3. The poison must reach the surface of the nodule, *i. e.*, communicate with the lumen of the vessel, a condition which is usually, if not always, satisfied in lesions of the thoracic duct.

4. The tubercle must not be situated in the portal vein.

Following Weigert's original work many investigators published observations which upheld and confirmed his doctrines. Not only were the tuberculous nodules of veins described in connection with general acute tuberculosis, but thoracic duct tuberculosis, in which we are especially interested, was noted.

Stillings,⁵ in 1882, found tuberculosis of the thoracic duct in 5 of 18 cases of acute miliary tuberculosis, while Meissels,⁶ in 1884, published the descriptions of 8 cases of acute miliary tuberculosis in some of which tuberculosis of the thoracic duct occurred. In the same year Koch,⁷ in his splendid work on tuberculosis, reports 11 cases of acute miliary tuberculosis in 2 of which he mentions an involvement of the thoracic duct. Koch, of course, first demonstrated the presence of tubercle bacilli in the lesions of the veins and lymph channels and pointed to the actual dissemination of bacilli, the poison of Weigert, by way of the general circulation to the various organs of the body. Subsequently, Weigert,⁸ in his own specimens, confirmed Koch's work regarding the presence of bacilli in the nodules in the veins and thoracic duct.

Later, Brasch,⁹ in a study of 24 cases of miliary tuberculosis, mentions an examination of the thoracic duct in 17 instances, and 9 times tuberculosis was discovered in this vessel. In 6 instances the tuberculosis was caseous in type. He emphasizes the relationship between involvement of the serous cavities and of the duct, and concludes that the infection is carried to the duct from the peritoneum and pleuræ and not through the lymph-nodes.

Hanau¹⁰ and Sigg,¹¹ Helbing,¹² and others, have also reported cases of thoracic duct infection, while more recently Benda¹³ has called particular attention to the condition. In a very large proportion of cases of general miliary tuberculosis, 12 out of 19, he found tuberculous disease of the thoracic duct and believes the localization of the process in this situation more than in any other gives rise to acute miliary tuberculosis. Benda considers that the primary infection of the vessel, whether it be vein, artery or thoracic duct, attacks the intima. The process arises by a deposition of tubercle bacilli upon the intima of the vessel. Naturally, this view has been frequently opposed.

Weigert's work and that of his followers has been criticised and his views strenuously contested by Wild.¹⁴ Though not denying the occasional occurrence of macroscopic lesions in the veins and thoracic duct, Wild explains the origin of acute miliary tuberculosis differently from Weigert. He does not believe that the general process arises from an overwhelming invasion of the blood by tubercle bacilli liberated from a single focus of disease situated in a vein or the thoracic duct. In his conception the point of entry of the bacilli into the blood-stream is hidden and obscure. By undiscoverable routes the bacteria enter the circulation in small num-

* Read before the National Association for the Study and Prevention of Tuberculosis, at its first annual meeting, held at Washington, D. C., May 18 and 19, 1905.

bers, and either here or in the organs multiply to produce the general infection. Though Wild is upheld in his views by Ribbert,¹⁵ whose pupil he is, his work has not been generally confirmed and his following is small. Weigert¹⁶ naturally confutes Wild's conclusions at every step.

From a short review of the literature it will be seen that more and more importance is being attached to tuberculosis of the thoracic duct as a point of origin of the general acute form of tuberculosis, while the lesions of the veins, particularly the pulmonary veins, which at first received so much attention, are now becoming of secondary importance. Silbergleit,¹⁷ however, in a recent discussion of the subject, describes only 5 cases of duct infection among 23 well-studied cases of general acute miliary tuberculosis, though either vein or duct tuberculosis occurred in 95.6% of the total number. It may be said, however, that to exclude a lesion in the thoracic duct the vessel must be dissected from the receptaculum chyli to its entrance into the left subclavian vein, since in certain cases only a solitary tuberculous nodule may be found in its extreme upper portion.

In the following 30 cases of tuberculosis, in which the process was more or less generalized, especial attention was paid to a study of the thoracic duct as a possible point of origin for the generalized process. Of these cases, 23 occurred at the Pennsylvania Hospital, and 7 at the Johns Hopkins Hospital. For this latter series I am greatly indebted to Dr. Wm. G. MacCallum, who placed the records of the autopsies at my disposal. The dissections of the ducts in most of the cases from the Johns Hopkins Hospital were made by Dr. Eugene Opie.

CASE I.—Male, aged 45, laborer, white, admitted to the Pennsylvania Hospital September 20, 1902, in delirium. Twenty-four years ago patient had pneumonia, and for years has had a slight cough. For two weeks before admission he complained of weakness and pain in abdomen. For a few days he has been acutely ill with delirium, which his friends ascribed to excessive drinking. Examination showed no pronounced lesions in lung. Kernig's sign was present September 30. Death, October 1. Temperature below 101°, respiration 36 to 40, pulse 120 to 136.

Autopsy, October 1, No. 303.

Anatomic Diagnosis: Chronic pulmonary tuberculosis, generalized acute miliary tuberculosis, tuberculous basil meningitis, with tubercles over ependyma, tuberculous ulceration of ileum, tuberculosis of thoracic duct.

Abstract of Autopsy Notes: The upper lobe of right lung is scarred and contracted by old fibrous bands. There are no cavities or large caseous areas. The lung is seeded with minute tubercles. The left lung also shows some scarring and contraction of upper lobe, but less marked than the right. Like the right lung, the cut surface is seeded with small tubercles, most numerous in the upper lobe. Spleen, liver and kidneys do not show macroscopic tubercles. The small intestines are the seat of a fairly extensive tuberculous ulceration, some of the ulcers being quite large. The retroperitoneal and mesenteric lymph-glands are much enlarged, firm, and gray on section.

Thoracic Duct.—The thoracic duct is thickened throughout its length, and the wall near the receptaculum chyli measures about 2 mm. in thickness and .5 cm. in circumference. Enlarged lymph-nodes are attached to it throughout its length. On opening the duct, the

surface is seen to be simply covered with fine raised granules, which can be distinctly felt.

Microscopic Examination: Tuberculosis of lung. No tubercles found in spleen, liver, or kidney. Tuberculosis of meninges and tuberculous ulcers of intestines.

CASE II.—Male, colored, aged 29, laborer, admitted to Pennsylvania Hospital on August 17, 1902. Entered with wound in back about fifth dorsal vertebra; operation, laminectomy, followed by paralysis of lower extremities. Wound discharged pus and patient had high temperature. August 21, complains of cough; September 6, developed bed-sores; September 14, cough again; September 30, wound gradually healing, cough continues; October 13, temperature very irregular, with frequent chills; November 18, cough much worse, extreme emaciation. Death, November 18.

Autopsy, November 19, No. 322.

Anatomic Diagnosis: Chronic pulmonary tuberculosis, with cavity formation on left side. Generalized miliary tuberculosis; tuberculous ulcers of intestines; tuberculosis of mesenteric lymph-nodes; tuberculosis of thoracic duct; fracture of arch of seventh dorsal vertebra; transverse myelitis; chronic pachymeningitis.

Abstract of Autopsy Notes: The right lung is sprinkled with small tubercles. In the upper lobe of left lung there is a large cavity, 8 cm. in diameter, with irregular corded walls. Three smaller cavities are seen. The remainder of the lung is sprinkled with small tubercles and caseous areas. No macroscopic tubercles are found in spleen, liver, or kidneys. The small intestines show many small ulcers, most of them about the size of a grain of wheat. The mesenteric lymph-glands are enlarged, firm, and caseous.

Thoracic Duct.—The receptaculum chyli is slightly enlarged. On opening the thoracic duct the walls are found to be thickened and the inner surface is distinctly roughened. Close inspection shows that the roughening is due to fine raised white glistening points thickly seeded along the duct.

Microscopic examination shows tuberculosis of the lungs with great numbers of solitary tubercles in the spleen, liver, and thoracic duct, large areas of coagulation necrosis in the kidney and mesenteric lymph-glands, tuberculous ulceration of intestines.

CASE III.—Male, aged 22, laborer, white, admitted to Pennsylvania Hospital March 13, 1903. Patient is a spare young man; gives history of 20 days' illness, with headache, pain in abdomen, considerable cough, expectoration, and fever. Lungs show harsh expiration and sibilant rales. Examination of other organs negative. March 14, leukocytes 2,400. During illness breath sounds are harsh and lungs show fine rales. Much cyanosis; continuous even temperature between 102° and 104°. March 26, convulsion. Death, March 26.

Autopsy, March 27.

Anatomic Diagnosis: General acute miliary tuberculosis, tuberculosis of mesenteric lymph-nodes, early tuberculous ulceration of ileum and colon, tuberculosis of thoracic duct.

Abstract of Autopsy Notes: Both lungs are filled with small tubercles varying from .5 mm. to 2 mm. in diameter. They are most numerous at the apices. There are no chronic lesions. Spleen is densely seeded with fine glistening points, but none can be made out in liver. Many small yellow tubercles in kidneys. Intestines show many small, shallow ulcers 3 mm. to 5 mm. in diameter. The mesenteric lymph-nodes are very large, pale, and soft. One, the size of a walnut, is filled with necrotic material. The retroperitoneal lymph-glands are also very large and soft, but deep red in color.

Thoracic Duct.—On opening the receptaculum chyli 2 cc. or 3 cc. of a thin bloody fluid escape. The walls of the structure are simply sanded with small glistening gray and yellow dots, which stand up above the surface and occasionally measure from 1 mm. to 2 mm. in diameter. In the thoracic portion of the duct groups of

the same granules cover the walls and extend into the lumen. Throughout its length the duct admits the knob of a pair of scissors 2.5 mm. in diameter. In places, however, it is difficult to pass the knob. Just at the point where the duct runs beneath the arch of the aorta, before the duct is opened a yellow mass about 2 mm. in diameter can be seen on the inner surface of its wall. On opening the duct at this point small, soft, caseous masses measuring about 2 mm. in diameter project into the lumen. The wall about is sprinkled with minute gray points. At the receptaculum chyli there is some slight thickening of the wall, but elsewhere it is thin and delicate.

No foci of tuberculosis can be seen in stomach, esophagus, urinary bladder, prostate, seminal vesicles. Microscopic examination shows small single and conglomerate tubercles in lungs, liver, spleen, kidney, adrenals, and myocardium, tuberculous ulcers of intestines, and a chronic tuberculosis, with caseation and necrosis of mesenteric lymph-nodes.

Thoracic Duct.—Smear from the fluid in the duct shows myriads of tubercle bacilli. Sections made near the receptaculum chyli show a thickened wall covered with foci of necrotic material. Some of these are quite large and jut out into the lumen. Some are very minute and form only a slight projection, which is covered by endothelium. The wall of the duct, as well as the fat about it, is infiltrated with epithelioid cells and small round cells. In the wall of the receptaculum chyli there are many subendothelial areas of necrosis surrounded by epithelioid cells. A few contain giant cells. Sections stained in carbol fuchsin show great numbers of tubercle bacilli situated in the caseous areas.

CASE IV.—Male, aged 39, colored, admitted to Pennsylvania Hospital April 26, 1903. Patient is a thin negro. He was taken sick two weeks ago with cough. Over right lung fine crepitations and rales; examination of other organs negative. April 28, leukocytes 2,900. Patient grew rapidly worse and died on May 4. Temperature throughout illness fairly regular, between 102° and 104°. Respirations rapid, 34 to 40; pulse 120 to 140.

Autopsy, May 5, No. 406.

Anatomic Diagnosis: General acute miliary tuberculosis; caseation of mesenteric lymph-glands; tuberculosis of the ependyma of lateral ventricles; tuberculosis of the thoracic duct.

Abstract of Autopsy Notes: Lungs are seeded with minute tubercles and do not show any chronic lesion. Spleen, liver, and kidneys show many small tubercles; no ulcers can be discovered in the intestines. The mesenteric lymph-nodes are large, some averaging from 2 cm. to 3 cm. in diameter; they are usually firm and on section show areas of coagulation necrosis. The retroperitoneal lymph-nodes are also enlarged but not as large as the mesenteric. They are studded with small tubercles. The stomach, esophagus, pancreas, urinary bladder, prostate, seminal vesicles, and testes show no tuberculosis.

The thoracic duct is large throughout its length and contains a moderate amount of milky fluid. On opening it the walls are seen to be studded at irregular intervals with small soft raised opaque yellow points the size of a pinhead, or with tiny dots. The walls are thickened. Just at the entrance of the receptaculum chyli into the duct there is a constriction, while beyond, the receptaculum is greatly distended with fluid. It measures about 4 cm. in length and 2 cm. in width. On cutting through the constriction the wall of the duct is seen to be thickened at this point and practically occluding the duct is a soft mass of caseous material. The receptaculum, like the duct, is studded with minute tubercles.

Microscopic examination reveals single and conglomerate tubercles of lungs, liver, spleen, and kidney with caseation of the mesenteric lymph-glands.

Thoracic Duct.—The walls are greatly thickened and

in many sections are covered with masses of necrotic material. About this necrotic lining the wall is densely infiltrated with lymphoid cells and epithelioid cells occasionally assuming an arrangement suggestive of tubercle, but no typical tubercles are seen. The surrounding fat is infiltrated with the same cells and some new connective tissue. Tubercle bacilli are seen in enormous numbers in smears from the fluid in the duct and are found in moderate numbers in the sections where they are situated in the caseous areas.

CASE V.—Male, white, aged 19, laborer, admitted to Pennsylvania Hospital March 8, 1904. Patient is a well-nourished young man; he has been sick 13 days with abdominal pain and headache. No change in organs except enlarged spleen. March 22, leukocytes 7,700; April 4, some bloody expectoration, examination of chest negative. Leukocytes continually low; gradually worse, and death on June 7. Temperature quite irregular throughout disease, remittent and varying from below normal to 104°. Respirations about 28; pulse 100 to 120.

Autopsy, June 10, No. 577.

Anatomic Diagnosis: Generalized subacute tuberculosis; tuberculosis of pleuræ and peritoneum; gelatinous pneumonia; tuberculosis of bronchial and retroperitoneal lymph-nodes; tuberculous ulceration of intestines; tuberculosis of thoracic duct, cloudy swelling of liver and kidneys.

Abstract of Autopsy Notes: The lungs show small and larger conglomerate tubercles together with areas of gelatinous consolidation. In the spleen, liver, and kidney are scattered caseous tubercle varying from 1 mm. to 1 cm. in diameter. In the ileum there are several small shallow ulcers. The bronchial and mesenteric lymph-nodes are very large and many are caseous or necrotic.

Thoracic duct is distended with slightly milky fluid. When it is opened several small gray and yellow granules are seen upon the inner surface of its delicate walls. They are not numerous and are only seen at irregular intervals. Smears from the fluid in duct show a good number of tubercle bacilli.

CASE VI.—Male, white, aged 16, laborer, admitted to Pennsylvania Hospital June 6, 1904. Patient is a young, poorly-nourished Italian boy. He has had a cough and has been spitting up blood for two months. Two days before admission he was exposed to cold and since then has had bad headache and felt worse than before. The physical examination reveals a positive Kernig's sign but no other definite signs. On June 8 a complete left-sided palsy developed. Patient gradually became unconscious and died on June 12.

Autopsy, June 14, No. 578.

Anatomic Diagnosis: Generalized tuberculosis; tuberculosis of pleuræ, pericardium, and peritoneum; tuberculosis and caseation of bronchial and mediastinal lymph-nodes; tuberculous ulceration of intestines; tuberculosis of cerebral and spinal meninges and of ependyma; tuberculosis of thoracic duct.

Abstract of Autopsy Notes: The lungs are filled with small tubercles; there are no chronic changes. The spleen and liver show tubercles, sometimes caseous, varying from 1 mm. to 3 mm. in diameter. The colon and ileum are the seats of moderate ulceration.

Thoracic duct is delicate and contains but little fluid. On opening it several minute gray tubercles are scattered over its inner lining.

CASE VII.—Female, colored, aged 20, admitted to Pennsylvania Hospital February 15, 1905. Patient is a young colored girl, admitted with delirium and complaint of stiff neck. Her mother and one brother have tuberculosis. The patient is supposed to have had influenza. There is stiffness of neck and inequality of pupils while Kernig's sign is present. No lesion found in other organs. The patient gradually developed exophthalmos and became stuporous and died in coma

on February 19. Temperature was below 102°. Pulse 90 to 100; respirations 24.

Autopsy, February 19, No. 665.

Anatomic Diagnosis: Generalized acute miliary tuberculosis; tuberculosis of bronchial lymph-glands with caseation; tuberculosis of thoracic duct; tuberculous meningitis; congestion of liver, spleen, kidneys, and lungs.

Abstract of Autopsy Notes: Minute tubercles are found scattered very thickly through the lungs, spleen, liver, and kidneys. There are no chronic lesions discoverable in the lungs. There are no ulcers in the intestines. The bronchial lymph-nodes are the seat of an old tuberculosis with caseation.

Thoracic duct is dissected out to its entrance into the left subclavian vein. The portion which lies next to the vena azygos major is very much dilated, rather nodular in appearance, about the size of a lead pencil and bluish in color. Beneath the arch of the aorta the duct is narrowed, rather tough, and thick. The duct is opened from the cephalic end. At the narrow portion there is a definite stricture through which it is difficult to pass the point of a small pair of scissors. This stricture lies a few centimeters below the entrance of the duct into the vein. The walls are thickened and the duct is narrowed by caseous material and fibrous tissue, forming a mass the size of a pea. Above the stricture the duct is seeded with gray and yellow granules the size of a pinhead. The stricture measures 1 cm. in length and in its upper portion the lumen is only a few millimeters in circumference. Below the stricture the wall of the duct is thickened and the lumen is dilated to a circumference of 1 cm. The wall is roughened and covered by minute gray and yellow points, which give it a granular appearance. This condition extends down the duct for about 10 cm. The granules gradually disappear, giving way to a thick white wall. The duct is filled with bloody fluid and red blood clots. In the region of the stricture the bronchial lymph-nodes are somewhat enlarged, firm, and deeply pigmented. On section they show small caseous areas and streaks of dense white fibrous tissue. The largest measures about 2 cm. in diameter. There is no direct connection between the process in the lymph-nodes and in the duct.

CASE VIII.—Male, aged 29, negro, admitted to Pennsylvania Hospital April 1, 1905, complaining of pain in the left side. The patient had pneumonia ten years ago and a chancre three years ago. His present illness began three weeks before admission with cramps in the abdomen, pain in the left side, cough, and fever. These symptoms have persisted ever since. Physical examination shows a well-built negro. The important points are dullness, loss of vocal fremitus and breath sounds in the axilla and low in the back on the left side. Later the dullness became movable and the signs of a left-sided pleural effusion increased. The temperature showed daily rises and falls, occasionally reaching 102° in the afternoon. On April 19, 250 cc. of turbid bloody fluid were aspirated from the left pleura. After this the patient seemed somewhat better and left the hospital on May 3. He returned on June 24, complaining of shortness of breath and swelling of the feet. The illness during the second admission was characterized by distention and tenderness of abdomen, impaired resonance, diminished vocal fremitus and breath sounds in the left axilla and back, with slightly irregular continued mild fever and low leukocyte count. Later a friction rub developed over right chest. There was progressive emaciation. A cough developed, the patient gradually weakened, and died July 7, 1905.

Autopsy July 14, No. 742.

Anatomic Diagnosis: General acute miliary tuberculosis; tuberculosis of pleurae, pericardium, and peritoneum; tuberculosis of thoracic duct; tuberculosis of bronchial, mediastinal, and mesenteric lymph-nodes; angioma of liver; acute splenic tumor.

Abstract of Autopsy Notes: Minute tubercles are scattered through the lungs, spleen, liver, and kidneys. There are no chronic tuberculous lesions in the lungs. There are no ulcerations of the intestines. Some of the mesenteric and retroperitoneal lymph-nodes measure 2 cm. to 3 cm. in diameter. They are soft, gray, and on section the cut surface is seen to be studded with minute tubercles. The thoracic duct is dissected out from the receptaculum chyli to its entrance into subclavian vein. About the receptaculum and all along the duct there are enlarged lymph-nodes 2 cm. to 3 cm. in diameter. Almost all of them are seen on section to be studded with small gray and white tubercles. Duct is dilated throughout its length and contains slightly bloody fluid. Just above receptaculum there is a small caseous nodule protruding into the lumen. It is about the size of a pinhead. Seven centimeters above this there is a large caseous nodule .5 cm. in diameter. Throughout the duct one sees at intervals small gray and yellow granules lining the wall. They become more numerous above the transverse arch of the aorta. About 7 cm. below the entrance into the vein there is a yellow nodule about 2 mm. in diameter. Several nodules a little larger are found upon the valve just at the entrance of the duct into the vein, while for a short distance below this the intima is seeded with tiny gray points.

CASE IX.—Male, aged 26, admitted to Pennsylvania Hospital August 14, 1905. Patient is an Italian and does not speak English. For two weeks he has suffered from a swelling in neck just below ear. Examination shows enlargement of the lymph-nodes on both sides of neck. Tonsils are swollen. Heart is apparently normal. Left lung is dull below nipple line and there are few rales in upper part of lung on inspiration. Impairment of resonance at both bases with rales. The tumors in the neck were opened; later the patient developed enlarged mesenteric lymph-nodes. On August 23 tuberculous glands were removed from the neck.

Autopsy September 8, No. 762.

Anatomic Diagnosis: Generalized acute miliary tuberculosis; chronic tuberculosis of prostate gland, mesenteric, retroperitoneal, peribronchial, mediastinal, and cervical lymph-nodes; tuberculosis of peritoneum, pleurae, and pericardium; tuberculosis of thoracic duct; acute splenic tumor; cloudy swelling of liver and kidneys; tuberculous ulceration of intestines.

Abstract of Autopsy Notes: Small tubercles, in the spleen just visible, are scattered through the lungs, spleen, liver, and kidneys. There are no chronic tuberculous lesions in the lungs. The collection of mesenteric lymph-nodes weighs 380 gm. and forms a mass which fills one's two hands.

Thoracic duct is dissected from the receptaculum chyli to the arch of the aorta, but there it is lost in masses of caseous material. It is delicate and contains very little fluid. Near the receptaculum chyli a few minute gray and yellow points dot its walls. Smears from the fluid in the duct show fairly large numbers of tubercle bacilli.

CASE X.—Male, aged 47, admitted to Johns Hopkins Hospital and died on July 18, 1902.

Autopsy July 19, No. 1964.

Anatomic Diagnosis: Primary tuberculosis of the epididymis and seminal vesicles; tuberculosis of the thoracic duct; acute miliary tuberculosis with miliary tubercles in lungs, liver, and kidneys; small cavities in lungs.

Abstract of Autopsy Notes: The mesentery contains large, caseous lymph-glands, the largest being about 1 cm. in length. In the retroperitoneal tissue near the aorta there are a few enlarged lymph-glands which become more numerous and larger above the diaphragm.

Thoracic duct is distended in its lower part and traced upward for about 12 cm., its wall becomes thickened and it has a nodular appearance, and there are opaque yellow masses which can be seen shining through the lumen. About midway between the diaphragm and the aorta it

receives a large branch which has a similar appearance. Above the level of the arch of the aorta the wall becomes soft and tubercles are not seen.

CASE XI.—Male, aged 50, admitted to the Johns Hopkins Hospital.

Anatomic Diagnosis: Acute miliary tuberculosis; tubercles in lungs, liver, and kidneys; tuberculosis of thoracic duct, edema of lungs; nodule in tonsil.

Autopsy No. 1957.

Thoracic Duct.—On exposing the thoracic duct immediately above the diaphragm on the right side of the aorta it is found to be dilated to a diameter of about 3 mm. Traced inward at a point 7 mm. below the highest point of the arch of the aorta the duct is found to be occupied by an opaque yellow mass, 4 mm. in diameter, occupying the lumen and shining through the wall. Above this point the wall of the duct is considerably thickened and the duct itself is dilated to about 6 mm. in diameter. Traced upward it is found to bifurcate a short distance before it enters the subclavian and jugular veins. The duct is opened from the receptaculum to its termination. Evidently the lower thoracic part is entirely free, but there are many lesions in the wall. The small nodule mentioned is found to occlude the lumen completely and consists of solid caseous material. About 2 mm. below this point there are a number of minute opaque slight elevations. Similar discrete and confluent elevations above the nodule involve a considerable portion of the wall. In the upper part of the duct there is adherent to the surface a small amount of fibrous material covered with blood. Immediately in contact with the duct, next to the caseous nodule occupying its lumen, is a large lymph-gland 2.5 cm. in length, succulent, and containing gray and opaque areas and in parts abundant coal pigment. The lymph-glands on the right side along the carotid artery are very greatly enlarged and have a similar characteristic appearance. Conspicuous is deep coal pigmentation. This gland forms a mass of considerable size. Beneath the arch of the aorta, at the bifurcation of the trachea, they form a large mass 3 cm. in diameter and black in color.

CASE XII.—Male, aged 43, admitted to Johns Hopkins Hospital.

Autopsy No. 1909.

Anatomic Diagnosis: Tuberculosis; primary in epididymis; ascending genitourinary infection; extension into lymphatics; infection of thoracic duct; acute general miliary tuberculosis; chronic left-sided pleurisy; chronic diffuse pericarditis; fatty degeneration of myocardium.

The retroperitoneal lymph-glands are enlarged, dry, and somewhat opaque. The mesenteric glands are also enlarged and contain definite caseous foci scattered over the cut surface; none is larger than a pinhead.

Thoracic duct is found to be normal above the receptaculum chyli; within the latter situation it was almost occluded by a caseous mass the size of a bean. A few other caseous foci were also found. No other lesions were recognized.

CASE XIII.—Male, aged 53, admitted to Johns Hopkins Hospital.

Autopsy No. 1858.

Anatomic Diagnosis: Acute miliary tuberculosis; tuberculosis of the mesenteric and retroperitoneal lymph-glands; tuberculosis of thoracic duct; miliary tuberculosis of lungs, liver, and kidneys; cyst of left epididymis.

The mesentery contains a large number of enlarged lymphatic glands, most numerous and largest at the base, where they frequently measure 2.5 cm. in length. On section of the smaller glands, they are found to be firm, gray, and succulent; the larger glands are yellowish-gray and in places quite opaque. In the retroperitoneal tissue are found larger glands of similar character, in great part opaque, yellowish on section; they are very numerous, particularly near the hilum of the left kidney and near the pancreas.

Thoracic duct is found above the diaphragm behind the root of the aorta, to the right of the median line; it passes upward behind the aorta toward the left. At a point midway between the diaphragm and the arch of the aorta it becomes enlarged and its outline becomes irregular, and at intervals can be seen groups of projecting nodules of a grayish, somewhat opaque color, usually about 1 mm. across. These become most numerous below the arch of the aorta, and here the duct is dilated to a diameter of about 6 mm., and its wall is considerably thickened, being from .5 mm. to 1 mm. in thickness. The duct bridges the bifurcation of the jugular and subclavian veins, and is here in contact with a large group of much enlarged lymph-glands, the largest 2.5 cm. across, similar in character to those of the abdomen.

Hardened Section—Thoracic Duct: The intima is beset with small raised elevations consisting of tissue, which merges into the wall of the duct and involves the muscularis. This tissue consists of lymphoid and epithelioid cells. The superficial part of the nodule has, in most instances, undergone necrosis, stains homogeneously with eosin and contains nuclear fragments. The section passes through a valve, and the wall of the pocket formed by it shows most extensive changes. Here almost the entire thickness of the duct is invaded by new-formed tissue containing giant-cells; extensive caseation has occurred to the internal surface, which is covered by a layer of fibrin. In the adventitia of the duct are numerous lymphoid cells. Stained for tubercle bacilli, many were found; they are particularly numerous in the caseous material near the internal surface of the duct.

CASE XIV.—Male, aged 24, admitted to Johns Hopkins Hospital.

Autopsy No. 256.

Admitted to hospital September 18, 1891; died December 1, 1891; farm laborer. Complained of pain in side, shortness of breath, fever. Parents both died, probably of tuberculosis. Patient always healthy when young; frequently caught cold; malaria two months ago, sharp attacks, lasting two weeks. Five days ago had bad pain in side, lasting 20 minutes; breathing, painful; no chills; no cough before. Had been exposed to wet. Bowels regular; pain better; coughing painful; no alcoholic or venereal history; no genitourinary trouble; urine, hyaline casts, faint diazo, no albumin; specific gravity, 1,020.

Present Examination: Well nourished, mucous membrane good color; tongue whitish coat; slight general erythema all over trunk; faced flushed; nervous look; temperature, 102.6°; pulse, 104; tension, dirotic. Resonance and respiration good in front and left back; below angle of right scapula and below fifth rib in right axilla, dulness. Vocal fremitus diminished, but present. Voice sounds somewhat nasal. Fine crepitus, not increased by cough. Heart—nothing remarkable. Abdomen—splenic dulness almost obliterated by tympany; not palpable. Liver—sixth (lower border) to costal margin, no tenderness; no gurgling; no rose spots. September 21: Urine, hyaline casts, no albumin, intense diazo. September 22: Hypodermic needle inserted over dull area; no fluid obtained; general range of temperature lower; patient seems bright; no splenic enlargement; dulness in right back more marked; feeble respiration; no abdominal symptoms; temperature, 103°, 100°, 102°. September 29: Two small papules (in addition to others noticed before) on back. September 30 to October 1: Temperature normal, rising again; diazo reaction reappears in urine after several days' absence; urine negative, lungs clear. October 8: Abdomen distended, patient dull. October 13: Right lung (lower) shows about same signs as before. October 25: Epididymis on left side swollen, hard, and nodular. November 16: Diazo reaction again appears; had been absent for several days. November 27: Average temperature

for last 14 days, 102° to 103°; very little expectoration. No tubercle bacilli found. Contrast between bases of lungs as regards intensity of sounds; in front below fourth rib on right side rales, tactile fremitus present. November 28: Patient has been delirious, picks at bed-clothes; pupils equal. November 29: Pupils unequal; left medium-sized, right moderately dilated; no evidence of hemiplegia. November 30: Blood—reds, 4,695,000. Urine—no albumin, no sugar, distinct diazo. White corpuscles, 10,000; hemoglobin, 85%. November 30 (8 p.m.): Pupils nearly equal; corneal reflex on left side sluggish; left pupil a little more active than right. Left arm almost motionless; right arm moved voluntarily; left arm drops as if paralyzed; right leg resists flexion and extension; left leg drops loosely. Patellar reflex small on both sides, more marked on left. Face symmetric. Patient unconscious, sank and died in early hours of morning of December 1, 1891.

Anatomic Diagnosis: Tuberculosis of left testicle and epididymis or cord, seminal vesicles and prostate; tuberculosis of abdominal glands and intestine (ulcers), and cerebral and spinal meninges; miliary tuberculosis of lungs, liver, and kidneys; tuberculosis of thoracic duct; solitary tubercle of cerebellum.

Abstract from Autopsy Notes: Lungs and heart removed in mass. Posterior mediastinal glands are enlarged and filled with caseous areas and miliary tubercles; in upper portion of mediastinum there is a lymphatic vessel size of 2 mm. in diameter, which can be traced some distance. It occupies the posterior portion of the thoracic duct. In the course of this is a tuberculous mass which apparently is formed around the lumen of the vessel and on section a lumen can be demonstrated. Owing to the general adhesions it is not possible to say whether this be a small vein or the thoracic duct. Pleurae over both lungs are enormously thickened; filled with a caseous material; along posterior edge of the right lung, just alongside of aorta, there is a distinct ridge-like projection which can be followed for some distance along lung and around its upper border. Both lungs on section contain numerous areas of miliary tubercles and there is here and there slightly peribronchial tuberculosis which in a few places has begun to break down. The bronchi in these places being dilated their wall is caseous and the caseous material extends in to the substance of the lungs.

CASE XV.—Male, aged 20, admitted to Johns Hopkins Hospital.

Autopsy No. 1838.

Anatomic Diagnosis: Acute miliary tuberculosis; tuberculosis of the mesenteric and retroperitoneal lymph-glands; tuberculous peritonitis with adhesions; tuberculosis of the thoracic duct; miliary tuberculosis of the lungs, liver, spleen, kidneys, stomach, intestines, and cerebral pia mater; diffuse tuberculous meningitis, limited to the spinal cord.

Abstract of Autopsy Notes: The lymph-glands in the retroperitoneal tissue in the neighborhood of the pancreas and on either side of the aorta are enlarged, often 1.5 cm. to 2 cm. in length, firm, and grayish on section, and at times partially caseous. The largest consists of a number of glands matted together and is 3.5 mm. across, and situated at the hilum of the left kidney. The glands at the base of the mesentery are similarly enlarged. The lymphatic glands at the level of the bifurcation of the trachea and at the base of the neck are enlarged and contain gray, at times opaque areas.

Thoracic Duct.—The thoracic duct where it lies to the right of the aorta just above the diaphragm is represented by an irregular nodular cord at one point where there is a deviation .5 cm. across; on section through this point of maximum dilation the lumen is found to be wholly obliterated, its wall indurated, and in the center is an opaque caseous substance. Below this point the duct dissected out is found to branch; branches

are conspicuous but are not dilated. Just behind and to the left of the aorta, the duct is represented by a cord about 2 mm. in diameter. Its walls are thick, grayish-white in color and there occur nodules of the appearance of tubercles about 1 mm. across, seen somewhat indistinctly upon the surface. The orifice of the duct where it enters the external jugular vein is patent and admits a probe, passes from inside the duct into the vein.

CASE XVI.—Autopsy No. 1174: Dr. Flexner.

Anatomic Diagnosis: Tuberculosis of lymphatic glands, generalized miliary tuberculosis (acute) with serofibrinous peritonitis and splenitis; chronic tuberculosis of peritoneal cavity as well as acute; acute splenic tumor; infarction of spleen; tuberculosis of thoracic duct.

The thoracic duct is opened and what seem to be minute tubercles are seen beneath the serosa.

CASE XVII.—Male, aged 45, colored, admitted to Pennsylvania Hospital October 4, 1903, in delirium. Clinical diagnosis, meningitis.

Autopsy October 14, No. 467.

Anatomic Diagnosis: General acute miliary tuberculosis; chronic tuberculosis and caseation of prostate and seminal vesicles; thrombosis of left vesicular veins (tubercles in section); chronic apical pulmonary tuberculosis; tuberculosis of meninges; tuberculous ulcers of ileum; chronic tuberculosis of adrenals.

Thoracic duct, normal.

CASE XVIII.—Male, aged 19, colored, admitted to Pennsylvania Hospital February 23, 1903. Since August, 1902, for last seven months, not feeling well; laid up three weeks ago. Death in nine months.

Autopsy No. 395.

Anatomic Diagnosis: Subacute generalized tuberculosis; tuberculous bronchopneumonia with cavity formation; tuberculosis of left pleura and of bronchial lymph-glands.

Thoracic duct, normal.

CASE XIX.—Male, aged 20, white, admitted to Pennsylvania Hospital April 27, 1904; was in hospital from February 22, 1904, to March 26, 1904, with questionable pleural effusion. Worked until three days before admission. Death on August 1, with clinical diagnosis of tuberculous peritonitis.

Autopsy August 2, 1904, No. 594.

Anatomic Diagnosis: Generalized tuberculosis with caseous nodules in lung, spleen, liver, and kidney; caseation of lymphatic glands; tuberculosis of peritoneum.

Thoracic duct, normal.

CASE XX.—Female, white, aged 13, admitted to Pennsylvania Hospital March 15, 1904. Laparotomy a year ago for tuberculous peritonitis. Admitted to hospital with this diagnosis, for which a second operation was performed. Death April 13.

Autopsy No. 547.

Anatomic Diagnosis: Unhealed old laparotomy; tuberculosis of mesenteric retroperitoneal and cervical lymph-nodes; tuberculosis of peritoneum; perforation of intestines; tuberculosis of spleen, intestines, and lungs; fatty degeneration of liver; anemia of all organs.

Thoracic duct, normal.

CASE XXI.—Male, white, aged 40, admitted to Pennsylvania Hospital October 10, 1904; clinical diagnosis, typhoid fever, with meningitis. Death, October 14.

Autopsy October 15, No. 617.

Anatomic Diagnosis: General acute miliary tuberculosis; chronic tuberculosis of left apex; tuberculous ulceration of intestines; tuberculous meningitis; generalized lymphatic tuberculosis.

Thoracic duct, a little thick; no definite tubercles. No tubercle bacilli in fluid from duct.

CASE XXII.—Female, aged 53, admitted to Pennsylvania Hospital November 22, 1904; sick three months; loss of weight; no definite signs detected in chest, some fever. Meningeal symptoms. Clinical diagnosis, tuberculous meningitis.

Autopsy December 4, No. 631.

Anatomic Diagnosis: General acute miliary tuberculosis; chronic pulmonary tuberculosis, with cavity formation; tuberculosis of uterus; tuberculous peritonitis; rupture of intestines, with acute fibrinopurulent peritonitis; tuberculous ulceration of intestines.

Thoracic duct, normal.

CASE XXIII.—Male, aged 19, white, admitted October 25, 1904, to the Pennsylvania Hospital. Malaise for ten days; thought at first to be typhoid, later tuberculous peritonitis; operation November 19, fecal fistula. Death, January 10, 1905.

Autopsy January 10, No. 645.

Anatomic Diagnosis: Generalized tuberculosis, subacute; tubercles conglomerate and fairly large in spleen and liver; chronic pulmonary tuberculosis; tuberculous peritonitis; laparotomy.

Thoracic duct, normal. Smears show no tubercle bacilli.

CASE XXIV.—Male, aged 21, colored, admitted to Pennsylvania Hospital February 8, 1905; sick seven days; operation for appendicitis. Death, February 21.

Autopsy No. 668.

Anatomic Diagnosis: Chronic tuberculosis of lungs with cavity formation; tuberculosis of peritoneum with acute purulent peritonitis; extensive tuberculous ulceration of intestines; appendectomy; tuberculosis of mesenteric lymph-nodes; cloudy swelling of liver and kidneys.

Thoracic duct dissected out to entrance into subclavian vein. It is normal. No smears from duct.

CASE XXV.—Female, white, aged 18, admitted to Pennsylvania Hospital February 16, 1905; sick since December 10, 1904, symptoms of meningitis; fever while in hospital. Death, February 25.

Autopsy February 26, No. 671.

Anatomic Diagnosis: Generalized tuberculosis, subacute; chronic tuberculosis of bronchial lymph-nodes; partial consolidation of right lung; bronchiectatic cavities in left lung; localized tuberculous peritonitis; tuberculous meningitis; tuberculous ulceration of intestines.

Thoracic duct, normal.

CASE XXVI.—Male, aged 66, admitted to Pennsylvania Hospital August 7, 1904; sick for four months; clinical diagnosis of tuberculosis of lungs.

Autopsy August 31, No. 600.

Anatomic Diagnosis: General acute miliary tuberculosis; acute tuberculosis of pleuræ and peritoneum; chronic tuberculosis of mesenteric lymph-nodes and of left lung; cloudy swelling of liver; acute splenic tumor; chronic diffuse nephritis; mesenteric lymph-glands size of man's fist, caseous.

Thoracic duct, normal; no tubercle bacilli found in smears from fluid.

CASE XXVII.—Male, aged 25, colored, admitted to Pennsylvania Hospital July 22, 1905, complaining of abdominal soreness and distention. This was noticed a few days before admission. There has been a chill and some vomiting. Physical examination showed some distention of abdomen with general tenderness, but nothing of great importance is noted in the remainder of the examination. During the course of the illness a left-sided pleurisy developed which was relieved by tapping. Masses could be felt in the abdomen. There was gradual emaciation with an irregular fever, and the patient died on September 9.

Autopsy September 11, No. 763.

Anatomic Diagnosis: Tuberculosis of peritoneum; tubercles in lung, spleen, liver, and right kidney; tuberculosis of pleuræ; congestion and cloudy swelling of kidneys.

The peritoneum is massed in caseous material. Caseous tubercles varying from 1 mm. to 3 mm. in diameter are scattered irregularly through the lungs, spleen, liver, and right kidney. Sections through the spleen and liver show sparsely scattered small areas of caseation.

Thoracic duct is thin and delicate throughout.

CASE XXVIII.—Male, aged 48, negro, admitted to Pennsylvania Hospital May 31, 1905. Except for a left-sided pneumonia, which the patient says he has had twice, there is nothing of importance in his past history. In March, 1905, he had a chill, followed by fever, cough, and severe headache. Since then he has been in poor health. Has had fever, continual cough, and occasional sweats. Examination showed poor expansion on both sides of chest, with increased vocal fremitus below right clavicle, where there is dulness and bronchial breathing without rales. Below left clavicle, fremitus is increased, there is decreased resonance, bronchial breathing, and rales. Posteriorly there is dulness along left side, with some suppression of breath sounds and decreased vocal fremitus. The patient gradually became worse. There was much expectoration. Emaciation was rapid. The temperature varied usually between 100° and 102° or 103°. On June 16, tubercle bacilli were found in the sputum. The pulmonary signs increased in severity. During the illness there were several intestinal hemorrhages. Finally, on June 21, the patient developed signs of meningitis and died on June 24.

Autopsy June 25, No. 730.

Anatomic Diagnosis: Chronic tuberculosis of apices of lungs; tuberculosis of pleuræ, pericardium, and peritoneum; tuberculous ulceration of intestines; tuberculosis of cerebral meninges; tuberculosis of spleen; cloudy swelling of liver and kidneys.

Thoracic duct is somewhat dilated and presents somewhat thickened but smooth walls. There are no tubercles.

CASE XXIX.—Male, aged 20, white, admitted to Pennsylvania Hospital April 4, 1905. The patient is said to have been sick for eight days with fever, headache, pain in stomach, and cough. On examination, the patient is found to have rales over both sides of chest; the abdomen is tender and distended but no other marked abnormalities found. The pulmonary symptoms increased, rales became more numerous and there was much sputum in which tubercle bacilli were found. Emaciation was marked and the temperature ran a very irregular course varying often 4° to 5° in a day. The patient finally died on May 23, 1905.

Autopsy May 24, No. 712.

Anatomic Diagnosis: Tuberculosis of lungs; caseous pneumonia of upper right lobe; multiple bronchiectatic cavities of left lung; tuberculosis of pleuræ; parietal thrombus on wall of pulmonary artery at pulmonary orifice; thrombosis of right femoral vein; multiple infarctions of spleen; congestion of spleen and liver; cloudy swelling of kidneys; tuberculous ulceration of intestines. Sections through the myocardium, spleen, liver, and kidneys showed no tubercles in these organs.

Thoracic duct, normal.

CASE XXX.—Acute miliary tuberculosis. Walls of thoracic duct free from tubercles. Many tubercle bacilli found in smears from fluid in duct.

Of these 30 cases, 19 were typical instances of generalized acute miliary tuberculosis, in which minute tubercles were scattered in enormous numbers through most of the organs of the body. When histories could be obtained the course of the disease was rapid, lasting usually from 2 to 12 weeks. The thoracic duct in 14 of the 19 cases showed a more or less extensive tuberculosis, usually with caseous nodules, while in one instance, though there was no tuberculosis of the wall of the vessel, many tubercle bacilli were found in smears from the duct lymph. In one of the four remaining cases in which the duct was normal there was a primary tuberculosis of the epididymis and testicle, with organized thrombi in the vesical veins, containing caseous masses and tubercles.

In eight instances the generalized process was subacute or chronic. Large tubercles or caseous masses were scattered in small numbers through the various organs, while during life the course of the disease was protracted, lasting from three to nine months. In only two of these cases was there a tuberculosis of the thoracic duct. In both instances the tubercles were small and occurred sparingly, but in one a few tubercle bacilli were found in smears from the fluid of the duct.

Finally, in three instances, the tuberculosis was of a chronic type and confined to the lungs and peritoneum. In all of these cases the thoracic duct was normal.

It is difficult to draw a line between the cases of acute and subacute generalized tuberculosis, but between the extremes of the two types a distinction can certainly be made. The cases with which we had to deal were fairly distinctive. Of the 27 cases of tuberculosis in which the process was more or less generalized, 17, or almost 63%, showed tuberculosis of the thoracic duct, or, as in one instance, tubercle bacilli in the lymph from the duct without lesions of its walls. Of the acute cases in over 79% the duct was affected or contained tubercle bacilli.

The type of lesion in the duct varied considerably. Sometimes there was a single large caseous nodule usually near the receptaculum or about the arch of the aorta, with small tubercles over the intima of the vessel above and below it; sometimes several caseous nodules were scattered through the duct, while occasionally the walls of the lymphatic were simply seeded with small tubercles. In every instance the lymph-nodes of the mesentery, retroperitoneum, posterior mediastinum, or bronchial regions were the seat of a chronic tuberculosis. At times several groups of glands were affected, but more often only one group, and rarely only one or two glands, as in Case VII.

Often the lesion in the duct appeared almost as old as that in the neighboring lymph-nodes and was in close association with it, though a direct extension of the process from the gland to the wall of the duct was never seen. In at least two instances the caseation of a small group of lymph-nodes and of the thoracic duct wall were the only foci of chronic disease which could be found in the body.

This intimate association between the lesions of the lymph-nodes and of the duct which existed so often, leads one to suppose that the infection travels directly from the lymph-nodes through the lymphatics to the thoracic duct. It is well known, through the experiments of Nicolas and Descos,¹⁸ Arloing,¹⁹ Ravenel,²⁰ and others, that tubercle bacilli when fed to dogs may pass directly through the intestinal wall without producing perceptible lesions, travel to the mesenteric lymph-nodes and rapidly enter the thoracic duct where they may be demonstrated soon after the feeding. The method of infection ascending from foci of disease in the abdomen or travelling from lymph-nodes elsewhere in the body through the blood to the lungs, has recently received much study. Harbitz²¹ has lately reviewed the literature upon this subject.

Apparently the same series of events takes place in these cases of thoracic duct infection. In a certain num-

ber of instances tubercle bacilli are carried to the thoracic duct from adjacent tuberculous lymph-nodes. Here they lodge and produce a localized subacute or chronic lesion. Sooner or later this nodule breaks down and enormous numbers of tubercle bacilli, as may be demonstrated by smears of the lymph, are liberated and swept by the lymph into the general circulation, producing an acute and rapidly fatal general tuberculosis. Even if a large tributary to the duct is the seat of a caseous tuberculosis, the same series of events may follow, and, as in one of our series of cases, tubercle bacilli would be swept into the lymph of the duct without of necessity producing changes in its walls, or, as has been frequently noted, only giving rise to a miliary tuberculosis of the duct itself. It has frequently been shown that neither during life nor at autopsy can large numbers of tubercle bacilli be demonstrated in smears from the blood, so that the mere presence of great numbers of tubercle bacilli in the lymph from the thoracic duct suggests that they are disseminated from a reservoir near by.

Of special interest are the cases of subacute generalized tuberculosis with lesions in the duct. In such cases it seems probable that from tuberculous lymph-nodes, tributaries to the duct, and small foci of tuberculosis in the duct itself, a few tubercle bacilli may from time to time be swept by the lymph into the circulation and scattered to different parts of the body, producing a chronic general infection instead of the rapidly overwhelming type of acute infection.

Our series of cases suggests, therefore, that the thoracic duct is of great importance as a channel for the spread of tubercle bacilli through the body from the various groups of lymph-nodes. Undoubtedly, tuberculosis of the veins and arteries is also to be reckoned as a factor in the rapid dissemination of tubercle bacilli through the body, but is subsidiary in importance to tuberculosis of the thoracic duct and its tributaries.

From a study of these cases the following conclusions may be drawn:

Tuberculosis of the thoracic duct is of great frequency in cases of acute generalized tuberculosis. The lesions in the duct from which tubercle bacilli are swept in great numbers through the lymph to the general circulation form the starting point for the generalized acute process. In certain cases of acute generalized tuberculosis, tubercle bacilli may be found in the lymph from the duct, though the duct itself is not the seat of tuberculosis. In a small percentage of cases of subacute generalized tuberculosis the duct may also be affected.

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FEEDING THE BABY.¹

BY

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Ideals, with a proper conception of "the ideal," are essential to success in any undertaking. The best in nature cannot be improved upon, and may well be studied thoroughly in any attempt to establish an ideal.

In feeding the baby, our greatest success results from having him at his mother's breast, when it is of the best. That should be our ideal. Unfortunately, too often the breast is not of the best; and then our endeavor should be either so to modify the breast that it accords with the proper demands of the child, or to secure a substitute that serves the same purpose.

Generally speaking, the well-fed baby is good-natured and comfortable, and each week shows a certain amount of growth. This rule has sufficient exceptions, such as make it always our duty to inquire as to the nourishment the child is getting, and also to examine him, to ascertain whether the increase in weight is of a healthy character.

Nature is so inexorable that if we violate her demands for any length of time we must pay the penalty. If we feed a baby on 1% of fat and $\frac{1}{2}$ % of proteid, when he should be getting 3% or 4% of fat and $1\frac{1}{2}$ % of proteid, we have a right to expect that he will show evidences of malnutrition. Frequently, a baby fed on condensed milk is good-natured and plump, and is held up to physician and admiring friends as the model baby. When we investigate the amount of nutrition he is getting, and then compare it with what nature intended him to have, do we wonder he is rachitic? Right here let us remember that enlarged epiphyses, crooked shafts of bones, and late dentition, are not the only manifestations of rickets; we may also have flabby, relaxed muscles, and the unstable nervous system. One part of "Eagle Brand" condensed milk to six parts of water gives .99 fat, 1.20 of proteid, and 7.23 of sugar. The baby is usually fed a teaspoonful of condensed milk to 4 oz. or 6 oz. of water—a fifth to an eighth of the nutrition stated above. Figure that out, if you will, and then compare the percentages with those which any baby is entitled to, and you will wonder that the child lives at all.

Feeding the baby is too often looked upon as a simple, mechanical process. We fill the stomach with anything the child will take, or, if he be old enough to express a preference, with anything he may desire. This principle will lead us to overfeed (overstuff) more often than to underfeed; but it will just as surely result in malnutrition and disease.

There is no question but that the mother's milk, where it exists, is the natural food for her baby; but

it is equally certain that there are many babies who do badly at the breast. The personal equation, as expressed by each infant's power to assimilate, enters into consideration almost as much in the breast-fed baby as it does in the artificially fed. We frequently see a baby starving on a good breast of milk, one in which the fat and proteids are within normal limitations. Here the baby's ability to assimilate is below normal, and the milk must be brought down to his digestive capacity. Again, a baby fails on a breast too rich in fat or proteid, one or both. Here again we must try and reduce the food to his requirements. If both fat and proteid are markedly deficient in the mother's milk, fat 1% or 1.5%, and proteid .5% to 1%, there is little probability of being able to improve the milk so that it will contain sufficient nourishment, and it is best to wean the baby or get a suitable wet nurse. Sugar in mother's milk is fairly constant as regards its amount, varying very little from 7%. It is well tolerated by the infant and seldom is to be regarded as a factor in the adaptation of the milk to the baby's requirements or digestive capacity. Fat and proteid vary under certain conditions, dependent upon the temperament, diet and occupation of the mother.

By means of the lactometer and a graduated cylinder, we can form a very accurate idea of the amount of fat and proteid present in the milk. The specimen to be examined should be taken after the first half ounce has been discarded from the breast, thus providing a specimen of average richness; the first drawn being specially thin, and the last of more than average richness.

Average good milk shows a specific gravity between 1,028 and 1,032. If the specific gravity is much above 1,032, it would indicate a high proteid, or an average proteid and a low fat; and if below 1,028, low proteid with possibly high fat. The fat is accurately determined by allowing the cream to rise for 24 hours in the cylinder, graduated to hundredths. The proportion of fat in the cream is as 8 is to 5 ($\frac{5}{8}$). If we have 8% cream, the fat will be $\frac{5}{8}$ of 8 = $4\frac{1}{2}$ %. Aside from an idiosyncrasy on the part of the baby, we can form a fairly definite idea of the nature of the milk from the history of the baby. Small, frequent, irritating, intensely yellow, or sometimes green stools; sour eructations from the stomach, almost always indicate excessive fat. The foregoing conditions existing, there is certainly an excess so far as the baby's capacity is concerned. Colic, constipation, curds in the stool mean excessive proteid.

If our nursing mother has a fair quantity of milk, but it is moderately deficient or excessive in either fat or proteid, we can do much to correct the discrepancy. If the milk is too rich, both fat and proteid being high, cut off alcohol, more or less decrease the nitrogenous food, especially cutting out red meats, and increase the mother's exercise, having it taken out of doors. If the milk is moderately deficient in fat and proteid, exactly the opposite conditions to the foregoing as regards alcohol, diet and exercise are to be advised. If, in the cases in which the milk is too rich, we are unable to reduce it by diet and exercise to the baby's capacity, we can modify the milk by giving before or during nursing a half ounce, more or less, of boiled water.

¹ Read before the West End Medical Society, New York City, April, 1905.

If the proteid is especially high, 5 or 10 drops of elixir lactopeptin added to the water serves a good purpose. When the milk is deficient only in fat, and the baby is inclined to constipation, a half to one teaspoonful of cream can be given before one or more nursings each day. It is interesting what can be done with a mother's breast milk, and with her baby, by using a little intelligence.

Not long since I saw a baby a month old weighing 6 pounds 10 ounces, who at birth weighed 14 pounds 2 ounces. The baby was nursed at the breast every hour as long as he could be induced to draw. Either while at the breast, or soon after being taken away, he would vomit about all he had taken. He was sour, and his stools were frequent and very irritating. Because of the rapid emaciation of the baby, it was taken for granted that the mother's milk was of a poor quality, and every endeavor was being maintained to make it better. The mother was not allowed any exercise whatever out of doors, though she had been about the house over two weeks. She had a glass of malt extract with each meal, and was encouraged to take as much meat and as many eggs as possible each day. A specimen of her breast milk showed 6% of fat, which told the whole story. The mother's diet was changed, she was sent out of doors for an hour at two intervals in the day, the baby's stomach was washed once each day, and before each nursing he was given 1 oz. of a 3% sugar water, after which he was allowed to nurse five minutes. The nursings were at two-hour intervals during the day and at four-hour at night. Under these regulations the vomiting stopped and the child almost at once began to gain. The mother's milk was soon reduced to 4% fat and the water given before nursing was gradually withdrawn.

The proteid is apt to cause more trouble than the fat, so far as colic is concerned; but here again much can be done by diet and exercise on the part of the mother. We can also modify the milk as it goes into the stomach by giving water before and during the nursing.

Bottle Feeding.—With the artificially fed baby, if the mother or the nurse is ordinarily intelligent, and the child has not already had his digestive apparatus upset, we ought easily be able to provide him with nourishment suited to his demands and capabilities of assimilation. Good dairy milk, not "one cow's milk," should form the basis of our food. In changing cows' milk for the babies' use, "adapting the milk" is a much better term than "modifying." Modify simply means change, while adapt means to fit, or suit; a conforming to a personal requirement.

Set formulas for feeding the young baby are an abomination, and inclined to cause more trouble than assistance. They tend to oblige the baby to conform to the rule, whereas we should all know that it is necessary to make the rule for the baby. Formulas can be followed successfully in only a minority of cases. At the present time an enterprising pharmaceutical house is engaged in distributing among physicians cards on which are printed formulas for feeding the baby from birth. We are told that the formulas are in accord with those contained in the book of a well-known New York pediatrician. According to these cards, we are to start the newborn baby on 2.5% fat. I doubt whether three out of ten babies could assimilate that strength of fat at birth. What about the other seven? If we are to

formulate any rule at all for feeding babies, it should be for the seven, rather than for the three. Our chief endeavor in starting to feed the baby should be to give what we feel is less than the baby can assimilate. We can easily and quickly increase the strength of food to reasonable percentages if the baby is able to care for the weaker food. It is a matter of clinical experience, regardless of the general strength of the food, that babies thrive best when our adapted milk is prepared with the idea of keeping the relative proportions of sugar, fat and proteid about the same as exist in mothers' milk—sugar, twice as much as fat; and fat, two or two and a half times as much as proteid.

Cereal Gruels.—There seems to be a great diversity of opinion, even at the present day, regarding the use of cereal gruels as diluents, or as a substitute for the regular milk food, in case of a gastrointestinal infection. It is a clinical fact that in the great majority of cases babies do better when a well-cooked gruel is used as a diluent than if plain water is used. This is the experience of practically all good observers. Still, not long since, a prominent New York pediatrician closed his part of a discussion by stating that "any medical man who advocates the use of cereal gruels in infants under 6 months of age, in health or in disease, should be sent back to the medical school to study physiology." My only criticism regarding this gentleman's ideas must be that, occasionally, people go through this world with their eyes wide open, and still they will not see.

If ordinary oatmeal, pearl barley or rice are used for the gruel, they should be boiled for three hours. Patent barley, groats, or wheat flour in the form of imperial grannum, need to be cooked not more than 20 minutes. For the youngest child, one or two teaspoonfuls of the cereal to the pint of water is used. After 6 months of age the cereal may be increased to one or even two tablespoonfuls to the pint. If a small amount of dextrin be added to the gruel, when lukewarm, the gruel is more easily assimilated, and a stronger gruel can be used. I usually use cereal, in the proportion of a teaspoonful to a pint of gruel. Gruels, when added to milk, certainly make a finer division of the curd; they also add a definite and substantial amount of nourishment. W. H. Jordan, of the New York Agricultural Station, gives the following as the approximate percentages of nutritional elements:

	Pearl Barley.		Barley Flour.		Wheat Flour.		Rolled Oats.	
	Proteid.	Carbohydrates.	Proteid.	Carbohydrates.	Proteid.	Carbohydrates.	Proteid.	Carbohydrates.
$\frac{1}{2}$ oz. to the pint of water.....	.07	.67	.007	1.04	.165	1.08	.181	.88

Cane Sugar or Milk Sugar.—In the thousands of babies fed at the Babies' Hospital clinic, it is a rare thing for us to use milk sugar. Our infants do well on granulated sugar too. Cane sugar is much cheaper than the milk sugar, and less apt to be adulterated. As good an observer as Dr. Brush refuses to supply his milk for infant-feeding if milk sugar is used in preparing the

food. He claims that milk sugar, when added to the food, is a prominent cause of contamination.

Working Formulas.—In the preparation of cows' milk for infant food there are a number of schemes recommended. It is well to select one that seems fairly simple, and at the same time fairly accurate. Which-ever the scheme adopted, we must keep constantly in mind certain approximate facts:

Mothers' milk contains 3.5% to 4% fat; 1.5% proteid; 7% sugar. Proteid of mothers' milk largely lactalbumin, is easy of digestion. Little casein.

Cows' milk 4% fat; 4% proteid; 4% sugar. Proteid of cows' milk largely casein, difficult of digestion by infants. Little lactalbumin.

Gravity cream (milk standing from 6 to 8 hours at or below 60° F.) contains 16% fat; 4% proteid; 4% sugar.

In using gravity cream, all the cream should be removed from the bottle and mixed. This gives us a uniform strength.

The scheme I will present is an old one. The basis of our calculation is always the pint, 16 ounces. Then, if we want more than the 16 ounces of food during the 24 hours, multiply the proportions used in making the 16 ounces by 1½, 2, 2½ or 3, depending on the number of ounces of food we need.

		Fat.	Proteid.	Sugar.	
(I)	Milk, 1 ounce Water, 15 ounces	.25	.25	.25	(⅓ clear milk)
	16				
(II)	Milk, 2 ounces Water, 14 "	.50	.50	.50	(½ clear milk)
	16				
(III)	Milk, 8 ounces Water, 8 "	2.00	2.00	2.00	(¾ clear milk)
	16				
(IV)	Milk, 6 ounces Water, 10 "	1.50	1.50	1.50	(¾ clear milk)
	16				
(V)	Cream, 1 ounce Water, 15 ounces	1.00	.25	.25	(⅓ of 16% cream)
	16				
(VI)	Cream, 1½ ounces Milk, 4 " Water, 10½ "	2.50	1.375	1.375	(½ milk, ¼ x ⅓ of 16% cream)
	16				

(One slightly rounded tablespoonful of granulated sugar equals approximately a half ounce.)

½ ounce sugar to 16 ounces (⅓ ounces) = 1 in 32; approximately 3%.
½ ounce sugar (3%) added to No. 6 = 2.50 fat, 1½ proteid; 4½ sugar; approximately

This makes a food of fair nutritive strength, and one that closely maintains the relative proportions of fat, proteid, and sugar to be found in mothers' milk.

Alkalies.—It is not necessary, nor advisable, to add an alkali regularly to the child's food. At the Babies' Hospital Clinic it is very exceptional for us to advise the use of lime water or sodium bicarbonate, and still our babies thrive. Certainly, if we have a good quality of well-kept milk there should be no excess of lactic acid before it enters the baby's stomach. If on general principles we add an alkali to the food, we inhibit the activity of the stomach and at the same time place increased responsibilities on the intestines. For its proper development, the stomach demands an opportunity to work.

Rather than to use alkalies, it seems to me we could better expend our energies in securing a better quality of milk, and having greater care taken in preparing and keeping the food.

Sterilization or Pasteurization.—Whether we sterilize or pasteurize the milk depends upon the quality of milk and the time of year, as well as on the care we can be assured will be taken in preparing and keeping the food. If you have a careful, fairly intelligent mother, and a good supply of milk, except during the hottest weather of summer, it is unnecessary to pasteurize (heat to 167° F. for 30 minutes). If the milk supply or the mother's care is questionable, certainly we must pasteurize; and if the weather is hot, sterilize (heat to 212° for 30 minutes). Explicit direction should be given the mother regarding boiling, each day, of all utensils used in preparing the food. This will include the nursing bottles and the nipples. Of this one fact we may be certain, the less the milk is heated before it is given the baby the better it will nourish him. A condition of actual scurvy, the result of too much heat applied to the milk, is frequently observed.

Difficult Feeding Cases.—The difficult feeding cases are usually manufactured; babies have fairly good digestive capacities until they have been more or less ruined. Too strong food in the beginning, especially as regards proteid; too much food at a nursing, and food too frequently given, are the principal causes leading up to difficult feeders. We have these cases every day at the babies' clinic. They did indifferently for a month or so on the mother's breast; they had some colic and they vomited more or less; they lost slightly in weight. At some one's suggestion they were taken from the breast, and, usually, were put on equal parts of cow's milk and water. This caused more colic and vomiting than the mother's milk; and they then began the proprietary foods, going through the list, and finally they ended up with condensed milk and marked evidences of malnutrition. We see the most of these babies when they are from 6 to 9 months, weighing anywhere from 5 to 10 or 12 pounds—a third or a half as much as they should weigh.

Where is the first mistake made on beginning to bottle feed under the above conditions? In not washing out the stomach and cleaning out the intestines, and giving the baby's stomach and intestines a rest for a few days, feeding only a weak sugar or dextrinized gruel mixture. Our next mistake is in starting with too much milk. Begin with as little as 2 oz. or 3 oz. of milk to the pint of food, adding 3% or 4% of sugar; then increase the milk gradually, adding ½ oz. to 1 oz. of milk to the pint of food, as the baby shows he is able to care for it. Rarely we find a case in which the weak milk mixture causes discomfort, while if we radically increase the strength of the food, the baby cares for it comfortably. Southworth explains this by the relative excess of hydrochloric acid secreted by the stomach to the small amount of casein in the weak food, forming tough curds. When the casein is increased within reasonable limits, the same amount of acid would combine with the larger amount of casein to form softer and more digestible curds. Occasionally it is necessary to remove all the casein from the milk, giving only the soluble lactalbumin

and a portion of the fat with the sugar. This, as whey, contains 1% lactalbumin, 1% fat, and 4% sugar.

Quantity at Feeding.—The number of ounces of food at a feeding should always be considered, and definitely advised; 1 oz. to 1½ oz. at birth are gradually increased, so that at three months of age, the baby is getting from 3 oz. to 4 oz. From this on, to the eighth or tenth month, the number of ounces at a feeding corresponds fairly closely with the number of months of age. Too much food at a feeding means an overdistended stomach, and a train of indigestion symptoms hard to correct.

Interval of Feeding.—The interval of feeding should never be less than two hours; rather make it two and a half hours, if there is any disposition to vomit. By the third or fourth month the interval should be increased to three hours, and after the eighth or ninth month to three and a half or four hours. After the third or fourth month there should be no feeding between 10 at night and 6 in the morning. If, for a time, food is demanded, give a drink of plain water or sugar and water.

Stomach Washing.—The difficulty of promoting assimilation of the food, and the growth of the baby, even though there be no vomiting, is markedly lessened by regular washing of the stomach each day. One stomach gavage is usually more effective than weeks of attempted medication.

Condensed milk, particularly the unsweetened, is frequently a valuable temporary food. It is especially good when there is marked inability for casein digestion. When constipation is a troublesome factor, and enough fat cannot be added to correct it, often a teaspoonful of Mellin's food or malted milk to each feeding will prove effective. With a child five or six months old, a tablespoonful or less of orange juice a half hour before one or two feedings in the day is another excellent means to relieve constipation. Orange juice is usually greedily taken, and it not only relieves the constipation, but furnishes the child with an element of nutrition which promotes a normal metabolism often lacking in the artificially fed infant.

In conclusion, I wish to express my appreciation for certain valuable suggestions contained in the writings and teachings of Drs. Kerley, Crandall, Chapin, Holt, and Southworth, regarding the subject we have just considered.

PRIAPISM A SYMPTOM IN LEUKEMIA: REPORT OF CASE.¹

P. L. GUNCKEL, M.D.,
of Dayton, Ohio.

The attention of the profession was first called to this peculiar symptom in connection with leukemia by Salzer, who, in 1879, reported an interesting case of priapism of six weeks' duration, and from his personal knowledge refers to eight other cases of leukemia in which priapism was the initial symptom.

Since the publication of Salzer's case in 1879, one or more cases of this character have been reported yearly.

¹ Read before Montgomery County, Ohio, Medical Association, May 2, 1902.

Most all of the later works on practice at the present time include priapism as a more or less peculiar symptom of this disease.

In April, a year ago, I treated a case of this kind, the report of which follows:

CASE.—C. L. C.; the patient was a tall, spare anemic man, aged 36; by occupation, an assembler, but he had worked at brass finishing for about five years previous to assembling. He was born and reared in Dayton, and was unmarried.

Family History.—Father met death by an accident. He always had good health. Mother is living and in good health; one sister living and in good health, and one sister dead of diphtheria.

Previous History.—During childhood he had rheumatism, measles, whoopingcough, and at the age of 12 he had malaria. Again, at the age of 25, he had an attack of malarial fever, which confined him to the house for about four weeks. He says he has never been well since this last attack of malaria, as a result of which he constantly complained of weakness. To relieve this weakness, he was constantly taking medicine. He has had gonorrhea a number of times and has had syphilis. He indulged in excessive venery, and would continue intercourse until a number of orgasms were expended before his insatiate appetite was appeased. Tuberculosis or alcoholism do not enter into the personal or family history.

Present History.—There is present a profound anemia. Heart, lungs, liver, and kidneys are apparently normal. An enlarged and slightly tender spleen is present. Urine is free from albumin and sugar. Genitourinary organs: An abnormal, persistent, and painful erection of the penis, unattended with sexual desire, constituting a priapism. This condition had existed about 36 hours previous to my seeing the patient and had resisted the therapeutic efforts of two physicians before me.

The patient gave a history of several attacks of priapism previous to this great and final one of several hours' duration, but these disappeared upon vigorous walking or working, thereby diverting his mind from the disagreeable condition. The attack previous to this one lasted 8 or 10 hours. The existence of the last priapism, which continued for about six weeks, so painful, persistent, and continuous, occurring in conjunction with a gradually enlarging spleen, is the subject to which I desire to call attention.

In appearance the priapism did not differ essentially from an ordinary erection, except the penis was probably slightly enlarged at its base.

The pain which this condition provoked was excruciating and almost unbearable, the penis standing erect at an angle of about 45°, and as rigid as is possible for an erection to be. Even the slightest touch upon the glans would bring forth a scream of pain from the patient. His suffering was so intense that it was necessary to keep him constantly under the influence of an opiate. The act of voiding urine, as one would naturally imagine, was attended with considerable difficulty. The act could only be accomplished by assuming a position similar to the knee-chest.

I am confident that from the treatment which he received from me and those who subsequently treated him that every therapeutic agent for the relief of this peculiar condition was tried, together with phlebotomy and complete anesthesia under chloroform. This priapism continued in its rigidity for about four weeks, after which time it gradually began to subside for the remaining two weeks of its existence to arise no more.

For the following additional notes I am indebted to Dr. W. J. Conklin, who had charge of the patient during the last four months of his life, and who watched the progress of the disease with a great deal of interest.

While he did not keep detailed notes of the case, he kindly furnished me with the following data:

Mr. C. came under his care after the disease had existed about four months. He complained chiefly of weakness; breathlessness on exertion, with an occasional sharp attack of dyspnea when at rest. Severe and nearly constant abdominal pain and diarrhea. There was no fever; emaciation was marked. Physical examination disclosed profound anemia; a spleen that extended nearly to the navel and was sensitive to pressure. The lymph-nodes in the neck, axillas, inguinal, and femoral regions were enlarged. Heart slightly hypertrophied, the apex being in the mammary line. An anemic bruit was distinguishable, which extended into the carotids, and the second aortic sound was accentuated. Lungs normal. Urine free from albumin or sugar. There was a decided puffiness about the ankles and feet. Several blood-examinations and counts were made. The report of the microscopic findings were, unfortunately, mislaid and he can only give the results in a general way. The white corpuscles were enormously increased in number and nearly equaled the red, which were greatly reduced below normal. In addition to a large number of myelocytes and lymphocytes, there were many very large mononuclear leukocytes. The color of the blood was quite characteristic. To the naked eye it was so colorless in appearance as almost to verify the popular phrase of "blood turned to water." Diarrhea continued to be a prominent symptom, and not infrequently the discharges were largely of blood.

Pain in the occiput, ringing in the ears, and breathlessness with the abdominal symptoms were constant and marked.

In view of the rather unusual beginning of the disease, Dr. Conklin states it may be proper to add that there was a total extinction of sexual desire and power while the patient was under his care.

Contrary to the usual ending in leukemia, the spleen during the last weeks of his illness was decreased materially in size.

He died of exhaustion about seven months after the appearance of the priapism.

Now, the question naturally occurs to me and to others, why priapism should exist in the course of a leukemia the existence of which has never been satisfactorily explained.

It is evident, however, that the changes which take place in the corpuscular elements in leukemic blood conduce to this condition, and the consequent leukocytosis produces certain changes in the bloodvessels that are concerned in the mechanism of an erection. Perhaps the most plausible explanation of the phenomenon advanced at the present time is, that priapism is due to a coagulation of blood into the bloodvessels, or possibly an infiltration of blood into the nonstriated muscular fibers of the corpora cavernosum, thereby producing thrombi. The thrombi may occur also in the walls of the bloodvessels, producing what are known as parietal thrombi, which, by depositing in the endothelial lining of the arteries during erection, prevent the returning tortuosity of the bloodvessels, which takes place in its passive state, the lengthening out and engorging of which constitutes the principal cause of a physiologic erection.

It should be noted physiologically that the vascular arrangement of the penis differs from all other tissues in the body, inasmuch as the arteries do not simply branch and divide dichotomously as in other parts, but are arranged arborescently and become immediately

tortuous and are distributed to the cavernous and spongy bodies. In these parts the arteries are large and tortuous and have unusually thick muscular coats and are connected with veins considerably larger than true capillaries; the arteries being supported in addition by a strong, fibrous, network of trabeculas, which contain nonstriated muscular fibers, so that when the bloodvessels become completely filled, the organ becomes enlarged and rigid. It is evident, therefore, that a normal erection depends mainly upon the peculiar arrangement and construction of the bloodvessels and not a simple congestion or stasis of blood in the penis as probably may take place in some conditions, producing priapism. There are others who believe that the causation of priapism may be found in irritation of the central nervous system, or by calcareous deposits along the course of the pudic nerve, or by intrinsic changes in the nerves incident to the leukemic blood. Of how much importance mechanical pressure by enlarged glands along the course of the nerves, or by pressure upon the veins, may be as a contributing cause in this condition, is not known at the present time. It is hoped that ere long a careful autopsic finding will clear up these theories, which seem at present to be mere surmises.

FATAL HEMATEMESIS, THE RESULT OF CHRONIC GASTRIC ULCER.

BY

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of Pittsburg, Pa.

On September 20, 1899, Mr. L., aged 40, came to me complaining that for two or three months past he had experienced distress in the stomach, which came on two or three hours after meals, and which was relieved by eating. The night before I saw him he had such a severe attack of pain as to require the application of hot fomentations to his abdomen; but he was not entirely relieved until he vomited. Examination showed the whole epigastric region very sensitive to pressure, and there was a circumscribed spot of tenderness to the left of the tenth dorsal vertebra. Suspecting an ulcer, he was put upon liquid food and bismuth. I also gave him some .5 gm. (8 gr.) orthoform powders with directions to take one should the pain return. That night and the next afternoon he again had an attack of severe pain, which in both instances was promptly relieved in 20 minutes by this remedy. The diagnosis now being established the orthoform was discontinued.

On September 25, the general tenderness over the stomach had disappeared, but a small circumscribed spot situated 2 inches below the xiphoid cartilage and extremely painful on slight pressure could easily be defined. This patient lived on liquids for 2 months, when, the tenderness on pressure having disappeared, he was permitted to take solid food and made an uninterrupted recovery.¹

The subsequent history of the case is as follows:

The patient enjoyed good health for four years after he first came under my care, but in January, 1903, he began to complain of attacks of bloating and belching, with pain coming on two or three hours after meals, which was relieved by taking sodium bicarbonate. These attacks came on every two or three months, and lasted a month or six weeks. For some years, and especially during the past winter, he had used alcoholic liquors to excess, and when under their influence had been in the habit of eating most indigestible articles of

food. However, during March, April, and May of this year he was unusually well, and experienced no trouble from his stomach whatever. About June 1, he began having pain immediately after partaking of either solid or liquid food, but instead of its being in the epigastrium, it was referred to the left hypochondriac region, and was

took place can be distinctly seen in the accompanying cut.

This is one of 32 cases¹ of chronic gastric ulcer previously reported, and the only one, so far as I have been able to ascertain, in which hematemesis occurred after the beginning of treatment. The patient had excellent health for four years after first consulting me, and I firmly believe that had he lived a rational life, he would still be alive and well.

I would ask, had this patient consented to an operation, what surgical procedure would have succeeded in arresting the hemorrhages?

REFERENCES.

- ¹Orthoform in the Diagnosis of Gastric Ulcer, New York Medical Journal, November 29, 1902.
²The Treatment of Chronic Round Ulcer of the Stomach, *American Medicine*, September 19, 1903.

RUPTURED ECTOPIC PREGNANCY COMPLICATED WITH APPENDICITIS: OPERATION.¹

BY

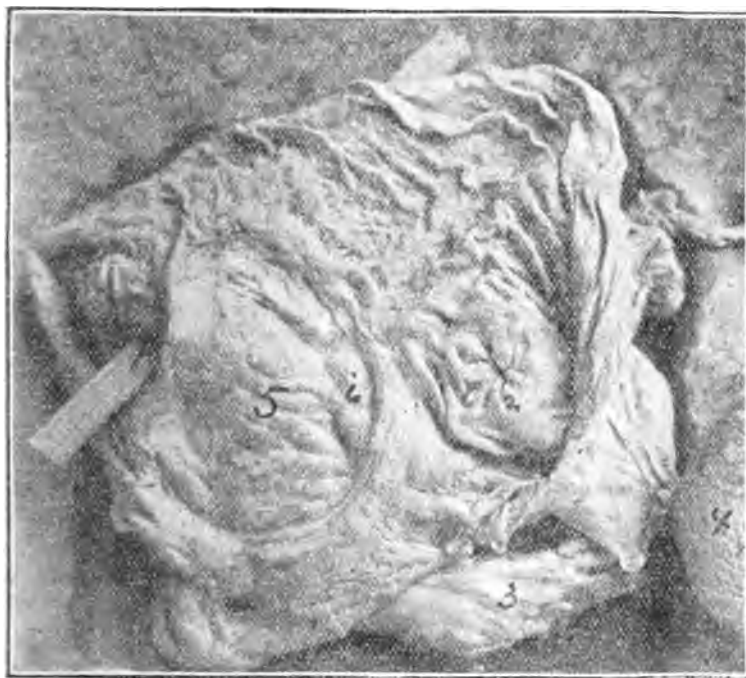
B. F. STEVENS, M.D.,
of El Paso, Tex.

The comparative rarity of this condition is sufficient excuse for the report of the following case. Kelly, in his work on the "Vermiform Appendix and Its Diseases," reports only having seen seven cases in his clinic. Pozzi and Kelly, in their works on gynecology, only give it passing notice.

The symptoms of an acute catarrhal appendicitis are familiar to all. The classic textbook symptoms of a ruptured tubal pregnancy are: Sudden onset; extreme pelvic pain; rapid pulse without temperature; signs of shock more or less marked, according to the amount of blood lost; sudden anemia; patient may or may not have been menstruating regularly, depending to some extent on the stage of gestation, though the menses usually cease as in normal pregnancy.

Physical examination discloses tenderness and rigidity over either iliac fossa, with presence of a tumor of variable size on vaginal examination, or the whole abdomen may be filled with blood, depending on whether the rupture occurs in the free abdominal cavity or into the folds of the broad ligament, as occurred in my case.

The symptoms of a right-sided ruptured tubal pregnancy are very similar to those of an appendicitis. We may have an accompanying menorrhagia in any form of pelvic inflammation, probably most common, however, in affections of the tubes and ovaries. Increase of temperature does not occur in ruptured tubal pregnancy, unless infection follows, which it usually does sooner or later in unoperated cases. We may have exacerbations, or repeated hemorrhages in extrauterine pregnancy occurring every few hours or days, thus simulating an appendicitis. As before stated, in rupture into the folds of the broad ligament, the symptoms are milder, the



1, pylorus; 2, cardia; 3, pancreas; 4, spleen; 5, ulcer; 6, open artery.

not relieved either by the administration of sodium bicarbonate or orthoform. Hot applications, or a large enema of warm water, often gave relief. On June 20, after taking some lamb broth, he was immediately seized with severe pain in the epigastrium and left hypochondriac region, which produced a condition of collapse, as his extremities grew cold, his skin became covered with a cold sweat, and he had great difficulty in breathing. Dr. F. D. Young, of Cambridge Springs, Pa., was called, and gave him a hypodermic injection of morphin, which relieved him, but Dr. G. E. Humphrey, also of Cambridge Springs, Pa., who had charge of the case, found it necessary to use morphin almost every day afterward on account of the pain and vomiting, until the morning of July 10, when he had a severe hemorrhage from the stomach, and soon afterward I saw him, in consultation with the physicians mentioned. After the hemorrhage, he was fed by the bowel for some days, and had no pain or vomiting for a week. At the end of that time he was able to take liquid food, which did not appear to give him pain, but vomiting soon returned and continued at intervals until August 9, when he had several hemorrhages during the night. These were repeated on August 13 and 14, and every few days afterward until September 1, when he died. After the first hemorrhage, adrenalin chlorid 1 to 2,000 was administered in 20 drop doses, three times a day, by the mouth, and after the second hemorrhage, gelatin was tried. Operation was urged, but refused.

The autopsy showed a large chronic ulcer, which measured $3\frac{1}{2} \times 2\frac{1}{2}$ in., situated on the posterior wall of the stomach, and extending to, but not involving the pylorus, consequently there was no dilation of the stomach. The base of the ulcer was formed by the pancreas, to which the stomach was firmly adherent, and this no doubt accounted for the pain in the left hypochondriac region. The point from which the bleeding

¹ Read before El Paso County, Texas, Medical Society.

pain may be intense, but there is little shock and the patient recovers quickly.

Early rupture is the rule. Pozzi reports 45 cases studied by Hecker, 26 of which ruptured before or during the second month. In 141 cases studied by Von Schrenck, 13 ruptured during the first month, and 67 during the second. My case was apparently three or four weeks along, the patient not having missed a single menstrual period.

CASE.—Mrs. M., aged 28. Family history negative.

Personal History.—Negative. Patient has been married six years, and has one child, aged 4. She has had no miscarriages, menstruates regularly, and has always been well.

Present Illness.—On December 15 she was suddenly seized with intense pain in the right lower quadrant of the abdomen, and also had a chill. She vomited profusely, and showed signs of moderate shock. There was no increase of temperature. Pulse ranged from 130 to 140.

Physical Examination.—Patient was pale. There was marked tenderness and rigidity over the region of the right ovary. Vaginal examination disclosed a tumor the size of a hen's egg in the right side of the pelvis.

Patient was given .02 mg. ($\frac{1}{4}$ gr.) morphin, and ordered to remain in the recumbent position with an ice-bag to the abdomen, no food or water to be given by the mouth. She was told that a ruptured extrauterine pregnancy was suspected, and that operation might be necessary. Early next morning I received a 'phone message that the patient was all right and that I need not call again, notwithstanding my explanation of the suspected gravity of her condition. Seven weeks later I was again called. I found the patient leaning over the edge of the bed, vomiting and crying, with intense pain in the right side. Physical examination at this time showed a tympanitic abdomen, with rigidity and tenderness over McBurney's point. Vaginal examination showed the same tumor as before, the size of a hen's egg. The pain was so intense, and the patient so restless, that vaginal examination was unsatisfactory. Temperature was 102° F.; pulse, 120; leukocyte count, 15,000.

A diagnosis of appendicitis was made and operation advised, which the patient refused. She was kept quiet, ice-bag to abdomen, no food or water by mouth for three days, and morphin as necessary for the pain. She was then put on liquid diet, and at the end of a week was sitting up. Ten days later she had a similar attack, which was treated as before, with apparent recovery. A week later she had still a third attack, each one apparently being caused by the ingestion of solid food. The patient now agreed to operation, which was performed six days after the inception of the last attack, and while she was still on a liquid diet.

Operation.—Under ether anesthesia, after the usual preparation. The abdomen was entered through a median incision, reaching from the pubis nearly to the umbilicus; patient in Trendelenburg position with intestines packed off, disclosed a hematoma in the right broad ligament the size of a lemon. There were numerous adhesions between it and the omentum, intestines, and appendix. The sac was very friable and was ruptured in taking it out. The appendix, which was red and edematous and quite adherent, was next removed, the stump being buried with a pursestring suture. The abdomen was closed in the usual manner. A washed-out iodoform gauze drain was left in Douglas' culdesac. Patient was given 800 cc. of normal salt solution under the breasts before her removal from the table. She stood the operation well, there was almost no shock. The case ran practically a normal course to convalescence, with the exception of a stitch-hole abscess, which did not cause much trouble.

The hematoma was the size of a small lemon. It contained blood clots, remains of portions of the ovary, and disintegrated fetus three or four weeks along. The walls of the sac were extremely friable. This was apparently a ruptured ovarian tubal pregnancy, at the time of her first attack, rupturing into the folds of the broad ligament, which accounted for the small size of the tumor, quick recovery, and slight amount of shock, the pressure of broad ligaments tending to limit the amount of hemorrhage.

The appendix was thickened, red, and edematous, and gave macroscopic signs of recent inflammations. It was 8 cm. long by 2.5 cm. in circumference. In slitting open its lumen, a complete cicatricial stenosis was encountered at about its middle. The distal portion was distended with a muco-pus. There were no concretions or fecal matter in it.

The patient left the hospital at the end of three weeks, and has had no further trouble since.

The question arises, whether this patient's later attacks were due to the appendicitis or to exacerbations of the ovarian pregnancy. A menorrhagia followed in from 12 to 24 hours after the inception of each attack. She had a temperature ranging from 100° to 103° with each attack, except the first one, with a pulse of 120. She had no increase of temperature during her first illness, but her pulse was rapid, from 130 to 140. The pain and nausea came on suddenly and were severe. The ingestion of solid food seemed to be the cause of the last two attacks. I made only one white blood count, which was at the beginning of the second attack. This showed a moderate leukocytosis of 15,000, which of itself meant nothing. The contents of the hematoma showed no signs of infection.

In my opinion, the first attack was due to a ruptured ovarian tubal pregnancy, rupturing into the folds of the broad ligament. This was probably ovarian, because of the small amount of ovarian tissue remaining. The later attacks were due, no doubt, to the appendicitis.

My thanks are due Dr. Hugh Crouse for suggestions regarding the management of this case.

Tropic Climatology.—R. W. Felkin states that the normal temperature of Europeans in the tropics is about half a degree higher than in Europe. Fresh arrivals have a higher temperature than older residents, as the former do not perspire so freely. The daily range is rather less than in Europe. Exercise increases temperature more quickly and it remains elevated for a longer time. Respiration is less frequent, oxygen inspiration and carbon elimination are diminished and the lungs give off less watery vapor. The pulse-rate is slightly slower and the heart does not beat so strongly. The urine is much diminished. There is a certain amount of anemia apart from pathologic processes. The nervous system is more or less enfeebled. The European's mental powers, after being stimulated for a few months, are depressed. Insomnia during the very hot weather prevents proper rest for the nervous system. Digestion is slow and imperfect. The liver secretions are often abnormal. Appetite is capricious. Weight is lost, muscular strength is lessened owing to want of tone. Repair after accidents is slow and nutrition is sluggish. Puberty comes a year or two earlier and miscarriages occur more frequently than at home. The simple fevers of the tropics are one of the myriad forms of heat or light fever. The light also produces nervous instability and irritability. The outer clothing should be white, gray, or yellow; the underclothing black or yellow. [H.M.]—[Archives of the Röntgen Ray, October, 1905.]

SPECIAL ARTICLES

CORRELATION OF MEDICAL TEACHING.¹

BY

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of Minneapolis, Minn.

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At the present day the knowledge required of the practitioner of medicine involves so many phases of scientific advancement and human activity that to give the student a proper working equipment of principles sufficiently reinforced by practical illustrations, taxes to the utmost the resources of the school and the ingenuity and power of the teacher. The old-time physician was, in his day, the ideal preceptor or teacher of medicine. As the naturalist has been replaced by a group of specialized workers in the biologic sciences, so the family doctor has been succeeded by a variety of specialists. Their knowledge in their specific lines is exhaustive, but each seems likely to have his general view somewhat curtailed and his perception of the importance and exact position of his brother specialist's field partially obscured.

The present highly artificial mode of life renders it necessary for the physician to keep pace with development in commercial and economic activities, if for no other reason than that he may recognize and treat the diseases which result from specialized occupation, and may foresee and prevent opportunities for the transmission of disease, which the complexities of modern rapid transit and the massing together of large bodies of people afford.

The universal use of the microscope, with bacteriologic and cultural methods, the very great advance in chemistry and physics in their application to the diagnosis, prophylaxis, and treatment of disease, the study of animal parasites as infective agents and the interesting researches into the specific reactions of body fluids and tissue extracts leading to greater accuracy in the diagnosis and treatment of disease and the solution of certain medicolegal problems, render it necessary to train the student of today in a great many different lines. This cannot be done by a single teacher, but requires a large staff, and involves some dangers, especially diffuseness. The old-time physician, acting as preceptor, if acute in observation and systematic in habits of study and record, was better able to correlate methods and results of observation and treatment for his pupil.

The medical school was founded with the hospital as the center from which instruction radiated and very rightly the patient continued to be the special object of study. As students increased in number, it became necessary to establish different chairs of instruction, and faculties were subdivided into the primary and clinical branches. The lecture method of imparting information prevailed and we all remember with pride and affection

certain of our teachers whose eloquence has left its permanent impress upon us even if the truths, at that time so clear, have faded from memory. We all likewise recall that each branch of instruction constituted a study entirely by itself and relationships of studies were absolutely undefined unless the instructor went outside the bounds of his own subject to point out relationships and the application of the truths he taught. While such duplication is bad, the failure to define boundaries was even worse, since it often left deserts in our education which years of the study and practice of medicine fail to render fertile.

In order to keep pace with the advance of modern science and to help students to retain knowledge of specialized methods and their application by affording opportunity to put them into actual practice; the practical laboratory method of instruction has been adopted for the primary branches. The cost of the laboratories has become so great that it seems likely that the commercial medical school, dependent upon student fees, must give place to the university with private endowment or State support, because in addition to the expense of building and equipment, laboratories require large corps of thoroughly trained men whose time shall be given altogether to the work of teaching and research. These men can be paid in part by opportunity for research, but must also receive sufficient income to live like their clinical brethren and maintain their professional status. There is a tendency to develop special laboratories purely for research, but to divorce teaching from research will prove disastrous since an atmosphere of research is absolutely essential for satisfactory teaching.

Close relationship to hospitals enables the laboratory man to take his proper place with the clinician in the study of disease, but it seems probable that the present tendency for the laboratory man to confine himself to teaching and research will increase. If such specialization is desirable, it can only be obtained by providing proper compensation for the laboratory man, otherwise he will be forced ultimately into practice.

In the endeavor to systematize for the student the knowledge which the laboratory study and methods afford, and to preserve certain times of the year to the instructors for research, the so-called "concentration" method of study has been adopted in some of the universities, with the case method of instruction in the clinical branches. Harvard has been the chief exponent of this system and Minnesota has followed. After an experience of several years it seems well to consider the possibility of improvement upon the method.

In the "concentration" method used in Minnesota the year is divided into two semesters and each semester into two equal parts. During the first year the whole of the first semester is equally divided between anatomy on the one hand and histology and embryology on the other, and the second semester is divided between physiology and chemistry. In the second year the first semester is divided between therapeutics, physiology, and chemistry, and the first half of the second semester is given to anatomy and histology and embryology, the second half of the semester being devoted to gen-

¹Read before the Minnesota State Medical Society, St. Paul, June 1, 1905.

bacteriology and pathology. The method of operation may be illustrated by stating that the student in the first semester of his Freshman year spends a half of each day in the anatomic laboratory and the other half in the laboratory of histology and embryology. The same arrangement obtains in the second semester for chemistry and physiology. Formal lectures are largely replaced by laboratory talks based upon the student's practical work and given as the need arises. When a thorough knowledge of anatomy, histology, embryology, physiology, and chemistry has been acquired the students devote every day for the last two months of the second year to study in one laboratory, where they are taught the subjects of general pathology and bacteriology. Instruction in bacteriology deals with the preparation of mediums, the biology and physiology of bacteria, and the various technical methods which are employed in the identification of the bacteria and their isolation in pure culture, bacteriologic examination of water, the action of physical and chemic agents upon bacteria, and in general, those phases of bacteriology which must be known before specific study of disease can be undertaken. When familiar with the general principles of bacteriology, general pathology is begun. This includes instruction on inflammation, degenerations, immunity, fever, antitoxin, and serum work and the general principles of tumors, etc. The two subjects are thus interwoven and the underlying principles of hygiene inculcated. In the first half of the third year, the entire time of four afternoons per week is devoted to what is known as special pathology and bacteriology. The pathology of the various diseases is taught and studied in special relationship to etiology. For instance, in tuberculosis, bacteriology is first taken up, and several varieties of tubercle bacilli studied and grown on the various mediums. Technical methods already learned are used by the students for the demonstration of the tubercle bacillus in tissues, fluids or other materials where it is commonly found. The whole life history of the organism is followed out, and its resistance to harmful agents is studied so that the principles and methods of protecting the public against this disease may be well understood. Animal inoculation is practised in order to study the pathology of tuberculosis. Thus the general and special effects due to difference in the portals of infection, the size of the dose, the virulence of the organism and the resistance of the host are all considered. The students learn not only the history of the typical tubercle and the details of its constituent elements, but other factors in regard to paths and methods of extension of the process with caseation, calcification, etc. Each tissue of the body is studied in gross and microscopic specimens from man and animals, and all available autopsy material is utilized. The other infective granulomas are studied in the same way at this time. Similar methods are used in the teaching and study of typhoid fever, the septic processes including pneumonia and anthrax, and throughout the work the pathology and hygiene of the various diseases are studied in relation to their bacterial cause or hematology and biology, in the case of animal parasites. This leaves, of course, quite a number of diseases and pathological processes still to deal with. The method of corre-

lating bacteriology and pathology in this way has yielded such satisfactory results that it seems wise to extend it in order that the chairs of medicine and surgery may arrange their work, so as to take up the various diseases just when the students are studying or have finished their laboratory work in bacteriology, pathology, hematology and parasitology. In fact, if such correlation could be extended throughout the medical course, so as to include all years, it would be most advantageous. In any event, approximation to this ideal is to be desired and sought.

When students come to a medical college fully equipped in the humanities, including modern languages, and with mathematic, physic, chemic and biologic training sufficient for their needs, some such course as the following might be pursued.

1. The time could be divided for the first few weeks among the laboratory subjects in order that the necessary general principles and technical methods might be instilled. For the sake of both teachers and students, these might be grouped in pairs so that the mornings could be given to one subject and the afternoons to another.

2. When such general knowledge and technic have been acquired in the branches of anatomy, histology, embryology, physiology, physiologic chemistry, etc., instruction should be given in the various branches along the lines of organology and special tissue study. For instance, when the anatomist has inculcated the musculature of the body with information in regard to the site, origin, insertion and relation of the various muscles, the histologist could take up the minute structure and the physiologist teach function with the necessary theory and experimental work within his province. The same method could be followed for the vascular and nervous systems and such related instruction is certainly to be desired particularly in dealing with the various organs of the body. The student should receive all his information and see each organ from the various points of view before having his attention distracted by other lines of instruction. At best he is apt to be somewhat mixed in his ideas and his sum total of information is not so readily available when the minute anatomy of an organ is taught him a long time after he has gone over his gross anatomy or geography. Function, too, cannot be understood without a knowledge of gross and microscopic structure and all three should therefore be taken up at approximately the same time. This principle of instruction along the lines of organology seems to be the most important in the first two years of medical training.

3. When such accurate and correlated knowledge of the normal has been acquired, the general principles and necessary technic of general pathology and bacteriology should be given, and might very well alternate with similar instruction along the lines of physical diagnosis and pharmacology in the latter portion of the second year.

4. In the last two years of a four-year course, when fully equipped with general principles and technical methods, both third and fourth year students might well take up the work together, since the full two years

would probably be necessary in order to cover all of the more common diseases. A single group of diseases or infection should be taken up at a time from the standpoint of etiology. When of bacterial origin, the bacteriology of the disease should be thoroughly inculcated, and the practical experimental work of the student supplemented by demonstrations. When infection depends upon hematozoa or other animal parasites, the same method can be employed. The pathology of these diseases and a thorough study of all of the tissues and organs of the body should be made at this time, so that the relationship of the local lesions, both gross and microscopic, to the general infection or disease process may be defined and understood.

Now is the time also to take up the special methods of protecting others from infection, when the nature and resistance of the virus, portals and paths of infection, means of elimination and such other basic details are under consideration. Hygiene thus taught is practical. The students are now prepared to receive instruction from the professor of medicine and his associates, and to study cases of tuberculosis in the hospital and dispensary. The professor of surgery, the orthopedist and gynecologist should take up the diagnosis and treatment of tuberculosis as it falls within their province. By such united effort, the student would have a comprehensive knowledge of tuberculosis, which it is impossible to acquire by the present disconnected methods in the same length of time. Nor should his knowledge of detail be less exhaustive because his grasp of the general problem is firm. In this way, if the more common diseases are studied and the student receives full information as to cause, general and local processes, prevention, diagnosis and treatment of a single disease at one time, it will be possible for him properly to appreciate relative values. The experience of all of us has been similar. We have received instruction on human anatomy. We may or may not have learned the use of the microscope and the minute structure of cells, tissues and organs. We may have had some lectures in physiology, and we may or may not have had experimental work, including physiologic chemistry and pharmacology. In any event, our information concerning the various organs or tissues has been received at irregular intervals from various instructors, and the amount of information retained and the vividness of our impressions have depended largely on the character, individuality and force of the instructor. Relationship of structure, development, and function, have never been made clear.

This is equally true in the later years of our student days, when the cause of disease and the local and general changes in anatomy and function have never been properly adjusted in our minds to the physical signs, symptoms, and treatment. It was quite common, and is still common, to teach the pathology of the individual anatomic systems, with the result that tuberculosis, syphilis, typhoid fever, or some other general disease which produces far-reaching results in many organs may be considered a number of times without affording a proper conception to the student of the whole process. For instance, the pathologist may teach tuberculosis of the lungs and a few weeks later tuberculosis of the

spleen, liver, intestine, or brain. At some other time, the professor of medicine, in taking up diseases of the chest, deals with tuberculosis, and the professor of surgery may not give instruction even in the same year on surgical tuberculosis. Here, too, the impression which remains with the student must again vary with the individuality and force of the teacher and with the opportunities at hand for illustration. Without correlation and the general summing up of these processes, it is very possible for one branch of medical teaching to become exploited and advanced at the expense of another equally important branch. Under present arrangements, medical teaching is likely to continue to be most irregular, and the student will be unable at any time—unless he has developed system more than most medical students are accustomed to do—to summarize his knowledge concerning any particular disease or disease process in relation to diagnosis, prevention, and treatment of that particular condition.

The "case method" of instruction is most important and should be included in such a general scheme as has been outlined, so that in the final two years the patient is the center of teaching and study. No individual case, however, is able to afford complete instruction on all the phases of medicine, and it will become necessary, therefore, to systematize certain wards or parts of the hospitals for this plan of teaching and research.

The main difficulties which such a plan suggests are the facts that one particular department may have a tremendous amount of work thrust upon it for a given period of time and for some time thereafter have little to do, while other phases of the particular subject are being presented by other teachers. Such time can be utilized in preparation for the next installment of work. Difficulties, too, in securing clinical material for illustration and study may be encountered, but these can be met by proper systematization. In Cambridge, Eng., there is a plan under consideration of which, as yet, no details have been published. This has for its object the forwarding of specially selected cases to Cambridge by skilled observers throughout the whole of Britain who are in sympathy with the project and are members of this Medical Research Society. A complete bibliography is compiled, including all phases of the particular disease which it is desired to study at that time. This bibliography is at the disposal of each member of the society, and through a central office each one of the members throughout the country is to be kept in constant touch with the work and is to furnish suitable cases to this central hospital as opportunity arises. The hospital is in direct relationship with the Cambridge laboratories, where concurrent chemic, bacteriologic, and pathologic studies of blood and various secretions, excretions, tissues, cells, and body fluids may be carried on.

A somewhat similar plan of cooperation with the alumni of any university would permit of the study of cases in series and could be utilized for undergraduate teaching. The study of typhoid fever or pneumonia offers no difficulties, since instruction in these diseases could be arranged for at the time of year when they may naturally be expected. This is true also of scarlet fever and diphtheria. The pus infections and t

may be studied at any time, since it is always possible to secure material and the rarer infectious diseases could be studied by keeping in touch with enthusiastic alumni or studious medical men in the neighborhood of the medical school. Even small hospitals could be made to serve the purpose if due selection of cases was exercised and the central office were sufficiently well organized to keep in constant touch with energetic practitioners who might reasonably expect to be furnished with a complete record of the clinical histories, laboratory findings, course of treatment, and results obtained. While it must be admitted that it would be impossible to study all of the diseases in relationship to their etiology, it should be done so far as possible and the fullest correlation between the various instructors should be maintained, so that full and complete information concerning the selected disease or process may be received from all of the sources at approximately the same time, in order that the total accumulated information may be filed at once, both in the mental compartment and written record.

It is probable that the teaching of today is too diversified and that attempt is made to cover too much ground. At best, the student can only be taught certain general principles and how to observe. It is, therefore, best to illustrate the methods of observation by the thorough study of a few disease processes rather than to attempt to cover the whole field of medicine. If he be properly taught how to approach his cases in a systematic way and to utilize every method of observation, the student's only difficulty will be to weigh the evidence which his eyes, ears, hands, microscope, or chemic tests afford him. If he is able to diagnose accurately the commoner disease processes and the changes which have been produced in the various tissues and organs of the body, if he knows the general principles of therapy and is taught to advise his patient and to protect others with whom he may be brought in contact, he can easily adapt the same methods to the study of other processes and other diseases when the necessity for it arises. Such a general plan of teaching will eliminate the dangers of too great specialization, whether along laboratory or clinical lines, and will promote the use of logical methods of deduction and neutralize the present tendency to "cocksureness," with the possible oversight of important associated or causative conditions.

Where so much is at stake, no effort should be spared, and we should not close our eyes to the present difficulties and dangers. At best, the machine must be complicated, but it may be made to work with smoothness and regularity if molded upon the lines of modern business enterprise. In any event, the public has a right to expect that medicine, the most important of all the professions, be taught as carefully and systematically as engineering or other technical work.

No Vaccination; School Shut.—A peculiar dilemma exists in the Stouffer school, in Bullskin township, near Connellsville, Pa., owing to a vaccination order. A few days ago State Commissioner of Health Dixon ordered all pupils that had not been vaccinated to go home, and when the order was obeyed not one of the 38 pupils remained. The residents are opposed to vaccination and the feeling is bitter.

DIGEST OF MEDICAL LITERATURE

TROPICAL MEDICINE.

MALTA FEVER.

A CRITICAL REVIEW OF RECENT INVESTIGATIONS.

BY

MAJOR CHARLES E. WOODRUFF,

Surgeon United States Army.

Malta fever, not being a disease of this country, has not received attention from American physicians, except as a matter of general or scientific information, but the increasing number of cases imported into the United States, and treated as rheumatism or malaria, makes its study of practical importance now that so many Americans visit countries where they may contract the disease. Recent investigations have also shown the possibility of the importation of the causative bacillus in other ways than in an infected human host. A review of its history and of the recent discoveries in its etiology is therefore of timely importance as it is not at all unlikely that cases might also arise here in the future. The disease has long been known by the British profession and dreaded by the army and navy stationed in the Mediterranean basin. On account of the large numbers of officers and sailors disabled now and then, it has caused considerable alarm. Its mortality was not large—about 2%—but its course extended over such a long period as to create a very disabling amount of invalidism. It averages three months in duration, though it may extend over a period of two years in exceptional cases.

It bade fair to jeopardize the British control of the Mediterranean, and it became a military necessity to learn how it was contracted and how it could be avoided. The British Colonial Secretary, therefore, in 1904 suggested to the Royal Society that a thorough investigation of the disease be undertaken. A joint commission of medical officers of the army, navy, and civil government of Malta was thereupon organized under the advisory supervision of the Royal Society, and their latest or third report proves to be of extreme value, not only from the practical side, but also from the scientific interest it is bound to arouse.

For a long while the disease was not recognized as a separate infection having its own specific cause. To be sure it was named from the locality—Malta fever, Mediterranean fever, Gibraltar or Rock fever, Neapolitan fever—but the other names given to it rather indicated a tendency to look upon it as an aberrant form of some other infection—relapsing typhoid, intermittent, rheumatism, undulant fever, sweating sickness, and such names were quite common. Its undulating course naturally led to the opinion that it was either malaria or typhoid with relapses, or a combination of both, but the discoveries of Laveran and Widal eliminated these infections from the problem.

The general picture of an infection, the soft, enlarged spleen, and occasionally enlarged liver, but no other lesions, the constipation, anemia, and debility, the period

of incubation of 6 to 10 or even 20 days, and the numerous pyretic periods of 1 to 8 weeks, with apyretic intervals of 2 or more days between, soon led investigators into a search for a bacterium. Such an organism would explain the malignant types fatal within 10 days, the intermittent types so closely resembling malaria, the neuralgic or arthritic complications with effusion, the invasion of the fibrous structures, and the occasional involvement of the testicles.

Through the efforts of David Bruce, of the Royal Army Medical Corps, *Micrococcus melitensis* was finally isolated in 1887 from the spleen of fatal cases and proved to be the cause. Agglutination tests were quickly devised, so that it was possible to make a definite diagnosis as early as the sixth day of the fever. It was now known for certain that the many fatal cases which showed the postmortem lesions of typhoid were not Malta fever at all but true typhoid. In true Mediterranean fever the morbid postmortem findings are merely those due to a prolonged toxemia, such as granular and fatty degenerations.

For eighteen years no further advances were made. The manner in which the bacillus entered the body was wholly unknown, opinions being naturally divided as to whether it was by air or water, though, curiously enough, there do not seem to have been serious discussions as to whether it could be introduced by foods. This omission from the accounts of the studies of the disease is most remarkable in view of the last report of the commission, which now leads investigation in that direction.

There did not seem to be any particular environment or set of conditions which could be held accountable. Cases would even arise spontaneously in hospital under sanitary conditions considered ideal. Sailors on ships, soldiers in garrison, and civilians on shore were stricken indiscriminately and without apparent reason.

The commission naturally directed attention to the viability of the micrococcus, and it was found to be most resistant. It survived 20 days in dry sand and as long as 72 days in damp soil, and a month or so in fresh or sea-water. The first report of the commission was published in the spring of 1905, and seemed to indicate that dust inhalation might be responsible, and certain experiments seemed to point that way. Two independent workers, Ross and Levick,¹ reported that they had experimented upon themselves by inhaling infected dust and did not contract the disease. At the suggestion of Ronald Ross, they also unsuccessfully made numerous experiments with *Stegomyia* mosquitos. They also proved that it was not transmitted by fomites or by direct contact with patients, though it can be contracted by laboratory workers, probably by accidental inoculation. Nor were they able to infect themselves by swallowing infected water.

The source of the infection was thus as much a mystery as ever. The second report did not help matters in this regard, though it contained much valuable information, especially as to the very long time the micrococcus could survive in various mediums

outside the body. It also was shown that the virulence of the organism was greatly exalted by rapid passages through guineapigs.

The third report mentions the fact that the organism can be obtained from the blood of about two-thirds of the patients, though not in large numbers. The higher the fever and the lower the agglutinating power of the blood, the fewer were the organisms recovered. They were found at all stages of the disease, and were more apt to be present in the late afternoon than in the forenoon. They were never recovered from the skin, sputum, breath, or the perspiration, but the urine contained them as a rule, sometimes in large numbers for a short time, but usually in small numbers as long as there was any fever. In one case they were recovered from the urine on the two hundred and forty-ninth day of the disease.

There were also further reports as to the long period of survival of the organism on various mediums, both dry and moist.

The most important discoveries were in relation to goats. It was found that over half of the animals examined gave a positive reaction to agglutination tests, and that one or more apparently healthy animals in every herd were excreting the micrococcus in their milk and urine. Goats which gave a negative agglutination test were fed with the living organisms, and within a few weeks gave a positive reaction and, in course of time, the organisms appeared in the urine and milk in enormous numbers. In one case the milk was still crowded with them nine months after the feeding. Moreover, the milk might contain considerable numbers and yet present no chemic or physical changes to arouse suspicion.

Though some experiments in administering infected food or water have failed, others have succeeded, and it is a fair inference that, as goats are proved to be infected in this way, it is the manner of human infection also. It is, therefore, generally believed that the commission has finally struck the right trail, and that practical prophylactic means will promptly follow.

It is now quite evident how men could have been infected by foods, though living in surroundings apparently ideal. It also explains why cases could originate in hospital, and also why it is so often a disease of the young, most of the cases being from 6 to 30 years of age. It reminds one quite forcibly of a similar revelation, following the discovery of the transmission of yellow fever by mosquitos, as to why patients could be infected though living in a sanitary manner. The mosquito was overlooked, and in the case of Malta fever, fresh milk from apparently healthy goats might be swarming with bacilli and its dangerous character unknown. To Americans who have not visited the Mediterranean, and particularly Malta, it must be explained that the goat fills a very important economic role on account of the impossibility of keeping cows. Some idea of these conditions must be obtained before one can appreciate the full significance of the new bacteriologic discoveries. It might be said that the whole Mediterranean basin has been the seat of numerous civilizations for many thousands of years. Populations have suffered great fluctuations in

¹ British Medical Journal, April 1, 1905.

density and have at times been quite numerous. Forests have been cut down and lands placed under cultivation, but the soil has been washed away by rains, so that once productive places are now more or less barren. Intensive cultivation has resulted in increased population, so that in many places every available inch of ground is now under cultivation.

In Malta and elsewhere the hills are all terraced to secure little flat areas for garden vegetables principally, the soil being held up by masonry walls. A horizontal view of parts of the island shows only the walls and gives a stranger the impression that the whole land is a rocky barren waste, but a ride into the country shows it to be a green garden spot. There is, of course, no grass for cattle, and as a matter of necessity goats are used, as they thrive on foods which would starve other ruminants. Indeed, a stranger often wonders how they exist at all. They apparently digest cellulose to a greater extent than is generally believed, and herein is their value.

Through centuries of selection a breed of goats has been produced which gives large quantities of milk. The little herds of these are driven from door to door and milked as needed. The udders are almost as large as those of our common or range cattle and the animals strike the visitor as one of the curiosities of the place.

If it proves to be true that this special breed of goats can harbor *Micrococcus melitensis* in such large numbers, and yet show no evidence of disease, and if the milk can be swarming with the organisms and yet be apparently normal, it is quite evident that the investigators have stumbled upon another instance of "tolerant immunity." In past ages the organism has, no doubt, been a saprophyte which has taken upon itself a parasitic existence, but through many centuries of adjustment by survival of the least virulent invaders and the most resistant hosts, the two live in apparent harmony. This process has been most interestingly described as to other organisms by Professor Theobald Smith, of Harvard University, and other biologists also.

Whether the invading organism confers any benefit to the host so as to be classed as a symbiotic remains to be proved. Nor is it known whether it normally still lives a saprophytic existence while traveling from host to host. Its vitality when dried and the ease with which it can be carried from goat to goat, being excreted in such numbers in the urine, would lead one to believe that it lives only in the goat or allied animals.

Its normal home being in the goat, it finds a new environment in other animals which may kill it promptly if they are racially immune, or which may let it live as in man if conditions are favorable. Malta fever is not, properly speaking then, a human disease at all in the sense of such diseases as the exanthems presumably due to pure parasites which do not invade other animals but man. It is more of the nature of glanders and anthrax—an accidental infection due to an organism properly belonging to some other animal. There is this difference, however, the bacilli of glanders and anthrax have not yet established harmonious relations of tolerant immunity or symbiosis, and are still at work killing off many of the animals they invade. *Micrococcus melitensis*

on the other hand has had thousands of years to establish its present relations, for the Mediterranean domesticated goat is no doubt a descendant of domesticated goats of prehistoric civilizations of this part of the world.

The relation to man of the diseases of the domesticated and wild animals, the human diseases caused by symbiotic organisms of these animals, are becoming of greater importance every year. The matter was recently discussed by Theobald Smith before the American Public Health Association.¹ He shows that bovine tuberculosis may be mild and latent, though perhaps the bacilli may be discharged from the secretions. Though he does not believe in the identity of human and bovine tuberculosis, he clearly shows that the bovine form can be transmitted to human beings, most of the cases, though, being in children. In glanders, also, a disease closely allied to tuberculosis, there are many horses found to harbor the organism harmlessly, so that the process of an evolution of a tolerant immunity is now going on. It would not be at all unlikely that we will find that Malta fever is similarly an accidental infection by an organism belonging to the goat in which it has established a right to live.

The practical importance of the matter lies in the fact that it has been proposed to import Maltese goats to this country for their milk. It is presumed that they are immune to tuberculosis, and that their milk will assist in establishing an immunity in children or adults to whom it is fed. If true, it would no doubt be a valuable addition to the other therapeutic measures for the tuberculous. It has been pointed out, nevertheless, that in avoiding the Scylla of tuberculosis, we might be destroyed by the Charybdis of Malta fever. We cannot disturb the geographical distribution of animals too radically. Malta fever is, indeed, a problem of the tropics not at all dissimilar to our tuberculosis situation. Malta fever has been recently reported from Shanghai,² the cases having been previously considered to be either enteric or malaria, and the diagnosis has been verified by Kitasato. It is also known in the islands of the Caribbean Sea and in South America. It is not at all unlikely that it is the real diagnosis in some of our obscure Southern fevers which are neither typhoid, paratyphoid, nor malaria. It exists in the Philippines. Indeed, it seems to be a tropic or subtropic affair the world over. The bacillus may be destroyed by northern climatic conditions on its way from host to host, in like manner to the death of the pneumococcus in the arctics. It may be unable to live in any other animals than the goat or possibly the sheep. The danger from it does not seem to be great in this country, but it is a danger, nevertheless, which it would be well to keep in mind. What animals harbor it in the West Indies, or possibly our South, cannot be surmised, but it is a matter for early investigation.

The Paris Academy of Sciences has awarded the Lalande prize to Professor William Henry Pickering, of Harvard University.

¹ Boston Medical and Surgical Journal, November 2, 1905.

² American Medicine, Vol. ix, p. 511, 1905.

PATHOLOGY.

THE RELATION OF SPIROCHÆTA PALLIDA TO SYPHILIS.

A CRITICAL REVIEW OF RECENT INVESTIGATIONS.

BY

ALLER G. ELLIS, M.D.

During the few months which have elapsed since Schaudinn and Hoffmann announced their discovery of a spirochæta in the lesions of syphilis, numerous reports from other observers have appeared, the majority being in German periodicals. In general, the findings of Schaudinn and Hoffmann have been confirmed and extended to include the presence of *S. pallida* in the local lesions of primary, secondary, and tertiary syphilis, in the blood of syphilitics, and in the internal organs of infants dead of congenital syphilis. Some writers do not hesitate to assert their belief that *S. pallida* is the exciting cause of the disease, but the majority are more conservative and are at present content to announce their findings without drawing positive conclusions. The appended brief abstracts of papers on this subject furnish a running summary of the work which has been done during the summer; from these papers the complete bibliography can be traced. A large addition to the literature of the subject may soon be expected from American and English investigators, many of whom are collecting extended series of cases before publishing their results.

Buschke and Fischer¹ recovered *S. pallida* from the liver and spleen of an infant dead of hereditary syphilis. The organism was not found in the juice from lymph-nodes nor in excised papules, but was found in blood removed from the subject during life.

Levaditi² found in one case of hereditary syphilis a few spirochætas in vesicle fluid and a great number in the scrapings from ulcers. In a second case the liver, spleen and lungs contained spirochætas, most numerous in the liver. In a third case the spleen, liver and pemphigoid lesions contained the organism. The richness of the liver in spirochætas is regarded as pointing to infection through the placenta.

Salmon,³ in a case of hereditary syphilis, found numerous spirochætas in scrapings from pemphigus bullas. No other organisms were found. Spirochætas were not found in the blood or in the nasal mucosa.

Moritz⁴ found numerous spirochætas in the bone marrow and muscularis of the small intestine of a subject in which the pathologic diagnosis was grave anemia with degeneration of the bone marrow, gastric and intestinal ulcers, fibrinous pleuritis, and lobar pneumonia. He stained only with thionin; that the organism was the *pallida* appears uncertain.

Hoffmann⁵ demonstrated *S. pallida* in pemphigus bullas, inguinal lymph-nodes, liver, and spleen of a child dead 10 hours from syphilitic pemphigus. It was also present in typical form in closed papules remote from the genitals.

Zabolotny⁶ isolated *S. pallida* from the contents of enlarged lymph-nodes and excised papules of secondary syphilis. He believes the *pallida* plays a role in syphilis, but we do not yet know if the spirochætas themselves

produce the lesions or if they represent only the transition form of some other parasite.

Fraenkel⁷ believes *S. pallida* is in etiologic relation to syphilis, and cannot understand why it was not earlier discovered. He finds the organism in almost every case of early syphilis. They are unevenly distributed, and extended search through a large number of fields may be necessary for positive diagnosis.

Levaditi, Nobecourt and Darre⁸ found *S. pallida* in the cutaneous lesions of a congenital syphilitic but not in the viscera or bone marrow.

Flexner and Noguchi⁹ demonstrated *S. pallida* in three of our cases of syphilis and failed to find it in two nonsyphilitic ulcers of the penis. In one case no spirals were found in stained spreads, although they appeared in the fresh material.

McWeeney¹⁰ found the organism in each of nine cases of syphilis; he discusses the possible nature of the spirochæta.

Tchlenoff¹¹ reports a study of 14 cases of syphilis, both chancres and inguinal lymph-nodes. He found *S. pallida* in all chancres and moist papules and also in one lesion of the tongue and one inguinal bubo.

Hirxheimer and Hubner¹² found *S. pallida* in the primary and secondary lesions of 14 cases of syphilis, but did not find it in the blood. In the superficial portions of the lesions, *S. refringens* was often found.

Raubitschek¹³ found spirochætas in the condylomas of a syphilitic and also in the blood taken from a finger.

Kiolemenoglou and Cube¹⁴ say that nonspecific lesions have not been searched for similar organisms thoroughly enough to make possible definite conclusions regarding *S. pallida*. They have found a spirochæta which could not be differentiated from the *pallida* in the secretion of an inflamed phimosis, in gonorrheal pus, simple balanitis, Bartholinian and scrofulodermic abscesses, necrotic carcinomas, and in pointed condylomas; it was always accompanied by the *refringens*.

Delamare and Tanasesco¹⁵ found *S. pallida* and *B. fusiformis* in a syphilitic chancre. This association possibly explains the phagedenic character of the chancre. [In view of the frequent association of fusiform bacilli and other forms of spirillums, the finding of these observers is of special interest. Very suggestive in this connection is the paper by Weaver and Tunnicliff,¹⁶ who grew mixed cultures of fusiform bacilli and spirillums from healthy mouths upon human pleuritic exudate and broth. Although the spirillums were never grown in pure culture, the possibility of obtaining even a mixed culture of the *pallida* when found with the fusiform bacillus should be borne in mind by those who are investigating the former.—A.G.E.]

Pascal¹⁷ found spirochætas in 10 cases of syphilis and none in nonspecific lesions.

Ploeger¹⁸ gives a summary of the lesions in which *S. pallida* has been found, but says it has not been proved the cause of syphilis. He states that observers should look for red blood cells in films, as the spirochætas are often found with one end in contact with a red cell.

Levy-Bing¹⁹ reports that injections of gray oil acted specifically and very rapidly upon *S. pallida*. In a non-treated patient, spirochætas were numerous, but six or

seven days after the first injection of oil they were very rarely seen and a week after the second injection they had almost completely disappeared. *S. refringens*, though much diminished in numbers, was still numerous, having diminished parallel with, but less rapidly than the *pallida*. Levy-Bing believes the influence of the mercury, and not the course of natural cure, caused the disappearance of the spirochætas. Notes of six cases are given.

Babes and Panea²⁰ studied three congenital syphilitic children, 1 to 4 weeks old, and found *S. pallida* in lymph-nodes, the liver, suprarenal bodies, and the blood. All organs and tissues showed the effects of syphilis. In one hemorrhagic case the blood presented some of the characters of leukemia.

Hoffmann²¹ found on the surface of three ulcerating carcinomas, one of the cervix and two of the skin, spirochætas distinguished with difficulty from the *pallida*, though some fine morphologic points sufficed to differentiate them; they were not found in metastatic nodules. He also found *Bacillus fusiformis*, some forms of which were sickle shaped or spiral, suggesting the possibility of them being developmental forms of spirochætas.

Rille²² furnishes a summary of findings to date, with bibliography.

Gordon²³ failed to find spirochætas in the cerebrospinal fluid of eight patients suffering from cerebrospinal syphilis or tabes, with a clear history of syphilis; also in the fluid of two persons with initial lesions.

Davidsohn²⁴ describes staining *S. pallida* with kresyl-violet.

Neoggerath and Stahelin²⁵ found typic *S. pallida* in the blood of three cases of secondary syphilis; 1 cc. of blood from the lobule of the ear was mixed with 10 cc. of $\frac{1}{2}\%$ acetic acid and centrifugalized, the spirochætas being found in the sediment.

Harvey and Bonsfield,²⁶ in studying mucous lesions of syphilis, failed to find spirochætas in films stained by Leishman's stain, but found them in three of four prepared by Giemsa's method. They also found with them fusiform bacilli resembling those in Vincent's angina. The writers say this symbiosis is worthy of notice, because such bacilli have been found with spirillums in pyorrhea alveolaris. Possibly the spirillums may be formed from large bacilli by longitudinal fission, as Leishman describes in the development of the parasite of kala azar.

Bandi and Simonelli²⁷ found *S. pallida* in three of five cases of secondary syphilis; the examined material consisted of blood from roseolous patches and scrapings from the bases of papules. Later,²⁸ they report finding the organism within the epithelial cells of mucous membranes. This suggests the possibility of it being a cell parasite.

Rizzo and Cipollina²⁹ found, in the juice of enlarged inguinal lymph-nodes of four cases of secondary syphilis, *S. pallida* in large or small numbers. It was also present in one flat condyloma, but was not demonstrated in papules, macules, the spleen, or circulating blood. The writers obtained from one mucous patch, fine, tortuous connective-tissue elements which resembled the spirochæta.

Spitzer³⁰ had no difficulty in obtaining positive results in the lesions of syphilis, including ulcerating and nonulcerating gummas. Other lesions were invariably negative. He warns against relying upon the finding of *S. pallida*, except by experts, in lesions of the prepuce, as other organisms resembling it are there present. Some links necessary to prove the spirochæta the cause of syphilis are still lacking.

Dudgeon³¹ recommends a modification of Leishman's stain for demonstrating *S. pallida*.

Reischauer³² found *S. pallida* in large numbers in the liver and a few in the spleen and lungs of a stillborn syphilitic child; none were found in the kidney or blood.

Rille and Vockerodt³³ say that *S. pallida* has been found in 22 different localized forms of syphilitic lesions in 14 patients; they believe they are the first to find it in extragenital primary lesions. They do not support the statement of Wechselmann and Lowenthal that mercury modifies the spirochæta, as they found perfect forms after the use of mercurial inunctions for ten days. Some forms of the *pallida* are regarded as indistinguishable from the *refringens*. Further reports of cases should include a description of the clinical phenomena and also state the duration of the syphilitic infection.

Bandler³⁴ and Shennan³⁵ each give an exhaustive review of the literature of the subject.

Vuillemin,³⁶ in a communication to the *Acad. des Sciences*, says *S. pallida* is a protozoon related to that causing dourine, and proposes for it the generic name *Spiromema*, and for the species, *Spiromema pallidum*.

Mulzer³⁷ concludes that *S. pallida* is present as a rule in the lesions of syphilis, and not in other lesions or in healthy people. Differentiation of the *pallida* and the coarser form is not specially difficult for an expert.

Kraus and Proutschoff³⁸ say the spirochæta found in smegma, balanitis and condylomas, can be differentiated from the typic *S. pallida*. From the investigation of lesions in more than 80 human beings and 4 apes, the writers conclude that *S. pallida* is absent from healthy men and apes, and constantly present in syphilitic products; it probably is the exciting cause of syphilis.

Nigris³⁹ found in blood from a maculopapular efflorescence on the foot of a syphilitic child of two months, both the *pallida* and the *refringens*. In the fluid of a 48-hour vesicle produced on a healthy portion of the skin of this child, the *pallida* only was found.

Richards and Hunt⁴⁰ found three forms of spirillums in scrapings from syphilitic sores and also the fine type in the bloody fluid obtained by pricking the spots on the abdomen, chest and arm of three persons showing secondary lesions of a few days' duration.

Hirschberg⁴¹ publishes a formula for Giemsa's stain, but the meaning of the first item is not clear; he has found *S. pallida* in the urine of a patient who exhibited active secondary manifestations.

Fanoni⁴² has found *S. pallida* in smears from five cases of syphilis, various primary and secondary lesions being studied. He gives the technic of staining by the methods of Giemsa, Oppenheim and Sachs, and Marino.

It is not amiss to mention in this connection that Siegel⁴³ describes a small flagellate protozoon *Cytor-*

rhyses luis found in the blood and tissues, particularly of inoculated animals, which he asserts is the specific cause of syphilis.

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REVIEW OF LITERATURE

Clinical and Pathologic Significance of Balantidium Coll.—R. P. Strong¹ furnishes notes of 115 reported cases, and adds one. Histologic examination of the intestine was made in seven cases, and in two of them the parasite was found in the tissues. In 90% of the cases diarrhea was a prominent symptom. An addendum contains notes of several additional cases, in some of which the parasite was found in the tissues. Strong believes we should attribute to the balantidium the same significance in cases of intestinal disturbance as we do to the presence of amebas in cases of dysentery. That the balantidium is capable of producing a primary erosion of the intestine has not been conclusively demonstrated. If such erosion exists from other causes, the parasite is certainly capable of continuing it.

Influence of Postmortem Putrefaction Upon the Agglutinative Power of Bacillus of Eberth.—C. Ferral² reports a series of graded experiments which he claims are important from at least a medicolegal standpoint. The agglutinative power falls in a direct ratio to the extent of putrefaction, and depends also upon temperature and other features of environment. Deutsch's views are controverted, in the light of results as they appear in these experiments. [T.H.E.]

Some Observations on the Occurrence of Micrococcus Zymogenes.—E. G. Birge³ refers to the case which was reported by MacCallum and Hastings, in which they isolated this organism from a vegetative endocarditis both from the circulating blood and at

autopsy, and which was pathologic for most of the ordinary laboratory animals. His own results are at variance with those of the above investigators. He has isolated from the mucous exudate in the larynx of certain crows a micrococcus corresponding morphologically and culturally with their organism, but in the ordinary laboratory animals large doses had a very slight effect. A rennin-like ferment is secreted by the organism which does not appear to be affected by small amounts of carbolic acid. It can be distinguished from *Streptococcus pyogenes* and from staphylococci by its characteristic cultural reaction in milk and by its doubtful pathogenicity. [H.M.]

Heteromorphic and Teratologic Forms of Bacteria.—L. Trincas¹ draws attention to the forms described by Gamaleia and also to the studies of Naegeli. The element of microorganismal adaptability is large, and the species must always be regarded as greatly modifiable. For experiments, the writers advise some addition to the usual medium, and have found that caffeine gives remarkable results with *B. coli communis*, *B. typhosus*, *B. paratyphoid*, and the different forms of *B. dysenteriae*. They soon develop many divergent types on agar-agar thus prepared with caffeine. Such methods can be applied to secure a differential diagnosis in cases of atypic diseases, for the branch forms do not maintain so rigidly their species. [T.H.E.]

Microscopic Study of the Lung after Mechanical, Experimental Asphyxia.—Roberto Serratrice,² under the direction of Professor S. Ottolenghi of the University Royal, of Rome, has made a series of experiments on rabbits, three groups of which were respectively hanged, strangled, and drowned. Ottolenghi has called attention to the position of importance held by the pulmonary elastic fiber. Results will have a value in medicolegal study, and more especially to determine whether trauma or a morbid process is responsible for the pulmonary disorder. It appears that: 1. Microscopic examination does not draw any pathognomonic distinctions, but is able to supplement effectively the study of macroscopic appearances. 2. The salient changes noted are: (a) Essential circulatory modifications, such as hyperemia, hemoglobinic extravasation, and hemorrhagic infiltration into the pulmonary parenchyma, which characterize the forms of hanging and strangling. (b) Those changes dependent on the fiber of the lung, such as alveolar dilation and stretching of the bronchioles, even to rupture of the respiratory channels. These indicate results of drowning. In the latter group, the circulatory changes are virtually limited to parenchymal ecchymosis, while in the former group, true for both strangling and hanging, are chiefly those changes which appear as restricted zones of emphysema and suggestive of atelectasis. 3. Between hanging and strangling the differences microscopically are trifling, but the latter death gives rise to zones of a peculiar type of interstitial emphysema, while the former inclines to the atelectatic variety. 4. The epithelial changes along the bronchial channels cannot be differentiated. 5. A positive differential can be made between the changes occurring in the pulmonary elastic fiber after death from pulmonary emphysema, or from some traumatic asphyxia, such as is met with in any of the three forms herein experimented with, for in the rupture of the elastic continuity by disease there is always a modification of the histologic appearances, while in either hanging, strangling, or drowning one can observe the true traumatic dissolution of fiber. [T.H.E.]

Dr. Zambaco Pacha has devoted the sum of 10,000 francs towards the organization of a medical congress to be held every three years at Athens.

¹ Bureau of Government Laboratories, Bulletin 26, December, 1904.

² Il Policlinico (Rome) 1905, fasc. No. 35.

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CLINICAL MEDICINE

THE PLACE OF ORIGIN OF ANTIBODIES.

A CRITICAL SUMMARY.

BY

EUGENE LINDAUER, M.D.

Immunity, the freedom from liability to infectious diseases, was first explained by Metchnikoff, when he elaborated his "theory of phagocytosis." He said all forms of immunity depended upon the activity of the body cells, all microorganisms and their products being destroyed by it. The bactericidal action of the body juices he explained by stating that bactericidal substances are dissolved out of the body cells, this action being dependent, therefore, also upon the phagocytic power of the cell. Buchner, Nuttall, and others disputed this, claiming that immunity was due to germicidal properties of the juices themselves. Behring's discovery of antitoxic serums increased the scepticism regarding phagocytosis, and investigations concerning antibodies of all kinds have been very numerous, especially since Ehrlich published his "Lateral Chain Theory of Immunity." This theory, although attacked by many eminent observers, explains more of the phenomena of immunity than any hypothesis yet brought forward, and must today be considered as the accepted hypothesis of immunity. It is founded upon the specific affinities existing between toxic and nontoxic substances on the one hand, and the body cells on the other. The body cells extract from the food particles surrounding them such substances as are suitable for their use and are provided for this purpose with certain receptors, which, due to their chemic composition, combine only with substances suitable for the proper maintenance of the cell. The food molecule is spoken of as haptophore. Haptophores suitable chemically for the nutrition of the body cells are to be found not only among the food proteids, but also among the poisonous proteids circulating through the body juices, the result of disease. They attach themselves to the receptors just as do the normal haptophores of the food. The toxic element of the molecule is spoken of by Ehrlich as the toxophore. If the toxophorous part of the molecule does not at once kill the cell, the receptors thus occupied will be replaced by others, and if the stimulation is sufficiently great, some of the receptors formed cannot find room on the surface of the cells, are extruded and circulate in the blood as free antitoxic substances, being still capable to unite with haptophores, thus neutralizing toxins; larger amounts of poisons can be recovered from and immunity against that particular organism or its toxin exists.

The fact that antibodies are a product of the reaction of the living organism and are actively produced by the tissues, and not, as has been stated by some of the earlier workers on the subject, metamorphosed toxins, is proved by the following observations: The time when sufficient antitoxin is produced to make animals immune varies in the same species with the same doses; pilocarpin, by stimulating the secretory power of the body cells, increases the amount of antitoxin formed in the same space of time; the blood of actively immunized animals has been removed in toto, and thus all the toxin

has been removed; within a short time the animal's blood contained as much antitoxin as before.

Among the questions of importance in the domain of immunity, few have received more attention than the mode of action of the antibodies and the conditions under which they are formed; exact experiments have made marked progress possible. The places of their formation have also been much discussed and much experimental work has been done on this subject. For a long time it has been the general opinion that the hematopoietic organs are the places of production of the antibodies, or, at least, that they are of the greatest importance for their production. Some of the investigators worked with bactericidal substances, others with hemolysins, bacterioagglutinins, hemoagglutinins, and antitoxins.

Pfeiffer and Marx¹ immunized animals against the cholera vibrio, and examined the bactericidal action of extracts and emulsions of different organs. They found the spleen and bone marrow to be more effective than the blood-serum, if the immunization had been brought about but a short time; later the serum was stronger. This, the authors believe, proves that the antibodies are formed in these organs and not simply stored there. Extracts of other organs also showed a weak bactericidal action. Wassermann² performed the same experiments with like results, employing typhoid bacilli for purposes of immunization. Van Emden³ immunized rabbits against *Bacillus aerogenes*; he then noted the agglutination power of the blood-serum and emulsions of different organs; the results were exactly as those described above. Jatta⁴ immunized animals against the typhoid and *Bacillus coli communis*, and found the splenic extract to be more agglutinative than blood-serum as late as the fourth day of immunity; after this, blood-serum was stronger. Castellani⁵ immunized rabbits against dysentery bacilli and injected cultures of this organism, together with splenic extract and blood-serum, into the peritoneal cavity of guineapigs; the former recovered with more certainty than the latter. The agglutination titer of the former was higher than that of the latter. Roemer⁶ immunized rabbits against *ulcus serpens*, with the same result. Deutsch⁷ found the bactericidal action of bone marrow weaker, that of spleen sometimes weaker, sometimes stronger than blood-serum. Metchnikoff and Besredka⁸ say that hemolysins originate in the organs, forming and containing macrophages, spleen, and lymph-glands. Taraskevitch⁹ also found these organs more powerful than blood-serum. Doemeny¹⁰ found the opposite to be true; this was true of all organs, even of those containing many large mononucleated cells. Inasmuch as the normal blood-serum of guineapigs dissolved the red corpuscles of dogs, Donath and Landsteiner¹¹ argued that the discovery of the cell variety of the guineapig, which protects dogs against these hemolysins, would discover the cells which manufacture the antibodies. They were able to immunize dogs by injections of serum, leukocytes, and erythrocytes. Blumreich and Jacoby¹² and Jakuschewitch¹³ removed the spleen of guineapigs, induced artificial infection, and compared them to guineapigs whose spleens were not removed. The operated

animals bore the infections better, their serum was more bactericidal, the leukocytosis smaller, and the serum less hemolytic. Removal of the spleen after the infection did not seem to have any influence. Brezina¹⁴ injected guineapigs with serum of chickens who had been treated with emulsions of spleen and bone marrow of guineapigs. He found that such animals' serum had a weaker agglutinating power toward *Bacterium coli commune* than that of guineapigs not thus treated. Forssmann¹⁵ injected botulism toxin into goats and found a larger amount of antitoxin formation (neutralization) when injections were made subcutaneously than when made intravenously; this he considers argues for a local production of antibodies. He had the same results where diphtheria organisms were injected. There was a production of antibodies after both injections, but it was less marked after intravenous injections, and he supposes the same to be true for other diseased antibodies. The maximum of the antitoxin curve after subcutaneous injections was reached on the fifteenth day, after intravenous injections on the tenth. Forssmann says all tissues have an antibody value and the curves of all tissues differ. Dzierkowski¹⁶ says that inasmuch as toxin absorbed into the circulation is at once neutralized by the antitoxin contained in it, the blood is not stimulated into antitoxin formation; very little of the toxin is neutralized by the subcutaneous tissues and therefore they form much antitoxin, this being absorbed into the blood; he used horses for his experiments. Wassermann and Citron¹⁷ say that all the cells of the organism are capable of formation of antibodies; the cells of the lymphatic apparatus are apparently the most important, because the substances injected are absorbed rapidly into the circulation, and therefore come into very intimate contact with the cells of the hematopoietic system. They injected living cultures of typhoid organisms into rabbits intrapleurally, intraperitoneally, and intravenously; exudates were then produced by aleuronat injections, and the fluids thus produced compared with the blood-serum. In almost all instances they found a greater amount of antibodies in the pleural and peritoneal fluid than in the blood-serum; the few exceptions which they noted they explained by very rapid absorption of the antibodies. Neisser and Wechsberg¹⁸ injected animals subcutaneously and intraperitoneally with staphylococci inducing immunity; the former injections resulted in large infiltrations and large amounts of antibodies; the latter gave no free antibodies at all. The importance of the subcutaneous tissues for the production of antibodies in local injections has been commented on by Ehrlich.

Ehrlich's summary of the question, as expressed by his disciple, Roemer,¹⁹ is that the antibodies are formed wherever toxic haptophores can find receptors with similar chemic affinities. Some microorganisms act only upon organs important to life; their toxophores react upon the cells very easily and therefore the receptors are replaced with difficulty, and little if any free antitoxin is found in the blood after the attack is recovered from. Other poisons find sensitive cells in tissues beside organs important to life and large amounts of antibodies are produced; example: experiment of Forssmann. Roemer introduced abrin in gradually

increasing doses into the conjunctival sac, thus inducing immunity; an emulsion of the treated conjunctiva protected mice against abrin; an emulsion of the other conjunctiva did not, thus showing that antibodies are formed locally by the conjunctival cells. The spleen and bone marrow showed a larger amount of antibodies up to a certain time (four days) than did the blood-serum. He found that animal organisms not sensitive to toxophores may produce antibodies in large amount, and that a small amount of the toxin may produce large amounts of antitoxin. Ehrlich and Roemer suggest the possibility that the cells of the vessel walls may be the structures from which the antibodies originate; he says they do not simply fulfil static functions, but are living organs undoubtedly important for the composition of the lymph and blood.

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A Medical College for the United Provinces of India.—A great effort is being made to establish a medical college and hospital for the United Provinces in commemoration of the visit of the Prince and Princess of Wales to India. The proposal was mooted 35 years ago, but has until recently been dropped. Already some 5 lakhs have been subscribed. The scheme includes a hospital, class-rooms, a library, museum, laboratory, and residence for students and professors. The whole of the United Provinces seem awakened to the necessity for this institution and the cities are vying with each other in the generosity of their support. If the public show a sufficient patronage toward its establishment the government will contribute to its maintenance and development.

The Plague Epidemic in India.—The epidemic of plague is following along lines similar to those of previous years. A temporary increase in the mortality of one week is followed by a small setback the next, but there is little doubt of the indications of a further development with the new year. For the week ended November 18 there were 2,826 deaths recorded. The local figures are: Bombay Province, 1,426; Madras Province, 51; Bengal, 223; United Provinces, 272; the Punjab, 233; Burmah, 66; the Central Provinces, 213; Mysore State, 104; Hyderabad State, 92; Central India, 143; and Kashmir, 3. These figures show an increase in six provinces and a small diminution in the deaths for the others. Continued efforts are being quietly made to popularize inoculation, but the numbers who accept this protection are so small as to have no appreciable effect on the local outbreaks.

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- "Wandering Spleen; Hemorrhage Within the Capsule; Splenectomy; Recovery." CHARLES P. CHILDE.
- "Puerperal Eclampsia." REGINALD DUNLOP.
- "The Surface Tension of Urine in Health and Disease, with Special Reference to Icterus." W. D. DONNAN and F. G. DONNAN.
- "Detachment of the Retina." JAMES A. CRAIG.

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Sanitary conditions in the canal zone come in for their share of criticism in an article by Mr. Poultney Bigelow.¹ It is painful reading at best, and were it not for the author's wellknown pessimism as to most things in the land of his birth it would be alarming. The optimist sees the doughnut and the pessimist sees the hole, but Mr. Bigelow can only see the size of the hole. Of course things are bad or were bad, and of course it is a tropic country with swampy towns and wretched sanitation or none at all, and of course the official reports mention only what has been done to improve matters. There was dreadful mismanagement at first, so bad, indeed, that the whole commission was dismissed, but things did improve for a while. It cannot be expected that everything can be corrected at once, yet there does seem to be a good beginning.

Yellow fever has practically gone, according to the October report, and the report also shows that no October on record shows such good results; that is, no October in which so many nonimmunes were on the Isthmus. Yet one gains an idea from Mr. Bigelow's article that the official reports do not give the proper impression, and, moreover, that nothing but mistakes have been made—such as government hotels not used or usable because built on swamps, and a sewer system which backs sewage up into houses when it rains; that laborers are uncared for and get sick unnecessarily; that there is room for more cleaning so as to need less disinfecting; that laborers have not received the promised pay and are deserting; that there is the worst kind of political jobbery, and so on through many counts. Many of these accusations may be just, for they sound like the aftermath of the first awful blunder of sending down thousands of men before there were any buildings for them to live in, or food to eat or water to drink.

That things are not so bad as stated in this depressing article must be hoped; but if they are, it is

¹ "Mismanagement at Panama," and published in *The Independent* of January 4.

good to have some one who is able to say so. The statements of disgruntled returning employes have always been discredited, but they have said essentially the same as Mr. Bigelow, only in more bitter terms. As there is no evident ax to grind or personal grievance in this case, it is the part of wisdom to listen to him. Some of the official reports are so self-laudatory as to give color to his strictures, and it would have been better if they were not so complaisant and could have told what future work was needed and planned. It now seems quite likely that Congress will insist upon a rigid investigation to sift the fact from fiction, and place the whole matter on a basis of law. The present plan does not work well—that's the only lesson we can draw until the facts are printed in full.

Government management of business affairs has received a violent blow by the history of the Panama Canal to date. The functions of government are vastly different from those of the citizens individually or in little groups or corporations. Governments have the sole duty of protecting the units from each other and from outside harm, and it collects money for this purpose and no other. It coordinates activities, does not take part in them. When it goes into life insurance, or railroad management, or canal building, it is out of its natural sphere, and is doing work for which it has no organization and no agents. Brains big enough to manage big affairs are generally doing big things for big pay, and will not leave the work for a government job. That leaves appointments for the small-brained failures, and they are not given intelligence by accepting a government position. If they have failed at one place they will fail in office, too. For these reasons, municipal ownership of street railways is proving very expensive and impractical. There is a general idea that if the government will only take hold, the thing is done at once, and done well. The only kind of work which stands such a test is that done by officials who hold life positions and

who cannot be injured for doing their duty. Occasionally men of large calibre are found in those positions who do well, as in the engineer corps of the army. Yet, as a rule, it is far preferable to do as New York City did in its subway—find out what is wanted and then pay a contractor to do it all. This may be the only solution of the awful muddle at Panama, for it now looks as though the government could not do the work and will be compelled to give it to a contractor after it has found out what it really wants. The matter has a painful medical side, for there is every prospect of future sanitary trouble if there is really as much unreported sickness as Mr. Bigelow states there is under the present government control. Nevertheless, we do hope he has looked at the zone through blue glasses, and that it is not really as bad as he thinks it is.

Football injuries have been described in the *Boston Medical and Surgical Journal* of January 4 by Drs. E. H. Nichols and H. B. Smith, who had professional care of the Harvard football squad during the last season, and it is grewsome reading. There were 150 men in the squad at the beginning of the season and these are the injuries they had received in prior years in the game:

Sprain of thumb, 9; bruise of knee, 1; cuts, various places, usually head, 5; bruised shoulder, 31; dislocation of elbow, 1; injury to back, 2; synovitis of knee, 39; sprain of ankle, 42; concussion, 7; fractured wrist, 2; dislocation of knee, 1; fractured rib, 4; dislocation of shoulder, 3; contusion of chest, 1; fractured clavicle, 7; ruptured muscle, 7; fractured arm, 4; injury to eye, 1; sprain of wrist, 3; ruptured internal lateral ligament of knee, 1; dislocation of thumb, 1; fractured toe, 1; broken nose, 16; fractured olecranon, 1; dislocation of ankle, 1; broken foot, 1; sprained toe, 1; fractured ankle, 2; fractured carpus, 3; fractured elbow, 2; dislocation of outer end clavicle, 5; fractured finger, 8; injury to kidney, 1; fractured fibula, 1; teeth out, 1; total, 216.

Of the 150, about 50 soon dropped out; and of the remaining 100, only 70 constituted the real players, and they, of course, received the most of the injuries recorded during the past season, as follows:

Sprained thumb, 1; fractured fibula, 1; cuts (required stitches), 12; bruises, 6; dislocation of elbow, 1; tenosynovitis tendo-achillis, 1; dislocation of xiphoid cartilage, 1; injury to back, 9; synovitis of knee, 3; sprained ankle, 13; strained muscle of side, 2; crushed fingers, 1; contusion of knee, 1; contusion side, 1; fractured rib, 5; rupture of internal lateral ligament knee, 1; dislocation of shoulder, 2; concussion, 19; ruptured muscle, 6; dislocated semilunar cartilage, 10; contusion of elbow, 1; compound dislocation of fingers, 2; traumatic valgus, 1; fracture of zygoma, 2; torn ear (sutured), 3; broken nose, 7; fracture of rim of pelvis, 4; fractured clavicle, 1; bruised hip, 2; fracture of semilunar of wrist, 1; dislocation of acromial end clavicle, 11; fractured finger, 4;

broken second cervical vertebra, 1; dislocation of inner end of clavicle, 1; rupture of biceps of leg, 1; middle meningeal hemorrhage, 1; hematoma of ear, 2; fracture of metacarpal bones, 3; sprained elbow, 1; total, 145.

Concussion of the brain happened to one or more players in every game except two, and the cases were of every grade of severity, from mere hysteric irresponsibility or confusion to complete coma. Loss of memory of events prior to the game was quite common and the normal mental state was only gradually restored. There was one case of cerebral hemorrhage. After reading this terrible indictment of the game it is quite evident that the human system is not built strongly enough to stand anything near the strains inflicted on it.

The severity of the injuries is best determined by the length of time the players were disabled to such an extent that they could not play. During the season the injured men were unfit for play 1,057 days, or nearly three years' time for one man, and they were unable to attend to scholastic duties for 175 days. At the end of the season 35 men were still suffering from their injuries, and many more who thought they were recovered were known to be still disabled more or less permanently. The writers conclude that football results in incomparably more injuries than any other game, and that there are more of them than is generally believed. As a rule, the injuries come in a "pile" and not in open play, and most of them are inherent in the game and unavoidable. They conclude, also, that the game does not develop the best kind of men, the only survivors being the beefy types with sluggish nerves which do not convey pains. Indeed, a certain amount of anesthesia is needed to play the game—a poorly developed pain sense, such as we see in savages—and it is quite evident that the average civilized man with normal sensibilities is positively unfit to play it. In addition, the authors state that the number of injuries is too great for mere sport which should not require the constant presence of surgeons! The real injury to the players is not even touched upon, for there is nothing said of the ultimate results of the cardiac hypertrophy due to the training; nor is there anything said about the possibility of premature arteriosclerosis from the muscular strains, nor the nerve exhaustion of beefy athletes, which so often results in alcohol or drug habits, nervous breakdown or increased susceptibility to infections, particularly tuberculosis. The after-history of these men will be interesting pathologic studies.

The great objection to football is a much deeper matter than the mere injuries to a few students—it is a fundamental defect of the educational system.

Of course it is wrong to put anyone in training at any time, to create a physiologic cardiac enlargement which remains to plague him in after life, but to place the growing boy under this regimen is nothing short of criminal. No college sport should require "training," no matter how much practice is needed, and no game should single out a few very abnormal men. Sports are necessary parts of youthful life, the essentials of a child's education, indeed, and every one must take part in them to educate the nerves—not to deaden them. Games are normal only when they cultivate perceptions to accuracy and quickness, but never should they put the tissues to their maximum allowable strain. The only use of the present game seems to be to afford relaxation to those on the grand stand—pale-faced boys who should be at some game themselves instead of rooting for the beef of the college. The gambling and commercialism do not concern the medical side of the matter, but are features having a distinctly pernicious psychologic effect upon boys at the very age they can be most injured. We hope that these dreadful Harvard revelations will be the final argument to convince educators and college faculties that they must wake up to their duty to regulate sport. Play of animals and children is really a means of educating or exercising other parts of the nervous system than the mere memory, which seems to be the main thing drilled in our college youths. If some play is beneficial—and there does not seem to be any doubt on that point, then it must be utilized and encouraged for every student, and not so utterly ignored and allowed to degenerate to a form which is injurious.

English football comes in for considerable praise at the hands of Ralph D. Paine in the *Century Magazine*, and it is apparent that he is correct. As played abroad, the game is merely one of the ways of getting young men outdoors to exercise and does not require "training" to play it; indeed, it is the training itself, for it is the natural and normal method of play in which young animals of all kinds indulge. It is said that the young Briton thinks that in no game is the work of long preparation worth the cost, and in addition, there is no fun in it that way, for it becomes business and not play. Finally, it is considered wrong to specialize in sports. A man who trains to do one thing, like putting the shot or sprinting, may be an addition to a college track team, and a team composed of such specialists may make big points in contest with another team in which there are only good all-round athletes, but the specialist is injuring himself, in that he is compelled to neglect parts of his physique to his own future injury. This period of life must be devoted to general development of both

body and mind as a preparation for the specialization which comes later in the serious business of life. Then again, there are not so many men injured in English football and a death is a rare accident. We have killed 27 in the last season, so it is said, not a very large mortality in comparison with the numbers who played the game, but just exactly 27 too many.

Japanese naval surgery was described by Surgeon-General Shigemichi Suzuki in a most interesting paper read before the Association of Military Surgeons¹ at their last annual meeting in Detroit. He does not mention anything new in the way of surgical technique or operative interference, for the keynote of all their methods is to do as little as possible. The report will no doubt be keenly disappointing to those who have read the popular literature, which seems to have imputed superhuman intelligence to the little oriental surgeons. Suzuki reports that they foresaw the impossibility of securing surgical asepsis on a warship in battle. Even in peace it is difficult and operations are never performed on shipboard except in cases of extreme urgency. Hence, the junior Japanese surgeons were ordered to make the wounds as clean as possible, dress them, and then leave them alone. Easily removed splinters of shell or wood were removed, of course, but no search was made for them. Their plans were devised with a view of removing the wounded to a real hospital on shore in the quickest possible time. The results of the system were very good indeed. Of the men who were struck, about half were killed outright—an illustration of the carnage of naval warfare when there are any casualties. Of the 1,791 wounded, only 117 died, though but 647 had been hurt sufficiently to require hospital care, and of these only 32 died.

Conservative surgery in war has had a brilliant vindication and the results should open the eyes of those who constantly write of the necessity of abdominal operations on the dirty battlefield. In modern land warfare also, the idea now seems to be to get the wounded back to where they can be properly treated. Suzuki wisely stated that it was wrong to spend a long time over a few cases and let the others wait, consequently they were all treated alike with temporary dressings. A modification of this rule is just as applicable in land battles. The details of the surgical technique he mentions are familiar to every ambulance surgeon—indeed, to every general practitioner. He marred his report by saying that they were convinced of the immense value of the aseptic treatment of wounds. American surgeons were convinced of it so long ago that

¹Journal of the Association of Military Surgeons for November, 1905.

if, at this late date, there are any who are not yet convinced, it is doubtful whether they can ever be convinced of anything. Taking it all in all, there is little or nothing to be learned from Japanese naval surgery, except the great lesson to do as little as possible in dirty surroundings. The idea of compelling the sailors to bathe and put on clean clothing prior to battle was new and excellent and no doubt greatly reduced the number and severity of cases infected by dirty clothing carried in by projectiles. In other professional matters it is evident that the Japanese have borrowed from the Occident and invented but little.

Interesting pathologic solution of a problem of £89,000.—An interesting example of the possible influence of contact of clinical pathology with forensic procedure was demonstrated in the Newcastle Law Courts (England) on November 18. A Mr. John Lockie, shipowner and ex-M. P., was placed in the dock on the charge of misappropriating £89,000 from shipping companies of which he had been the managing director. The trial had not proceeded far when it was observed that the defendant was in a fit. He was carried out of court, and examined by Drs. Clay and Hope, who testified that he was suffering from a paralytic seizure, and was but partially conscious, so that complete (mental and physical) rest was absolutely necessary. Judge Darling then said that it was impossible to proceed with the case, as the whole question of fraud could be solved only by the explanations which nobody but the defendant himself could give. Legally, the trial could go on in his absence, but it was perfectly obvious that the jury could form no definite conclusion. Even if the defendant recovered by next day, to put him in the witness box would only bring on the risk of another seizure, which might be more serious or even fatal. Under such circumstances he could not think of dealing with the man, and would have to discharge the jury and bring that particular trial to an end. It depended on the state of defendant's health whether he was to be put on his trial again and when. On the question of bail, his lordship said that Mr. Lockie was to be taken to the infirmary, and in the circumstances he would not keep him till bail was found. Accordingly, he had nothing to do but to discharge the jury from giving a verdict. (He directed that the defendant should be bound over in £100 in his own recognizance to appear at the next Assizes if called upon.)

American Association for the Advancement of Science and the societies affiliated with it held a meeting at New Orleans last week. Professor W. G. Farlow, of Harvard University, gave the presidential address, his subject being "The Popular Conception of the Scientific Man at the Present Day."

BOOK REVIEWS

Textbook of Insanity.—By Dr. R. VON KRAFFT-EBING, late Professor of Psychiatry and Nervous Diseases in the University of Vienna. Authorized translation from the last German edition by CHARLES GILBERT CRADDOCK, M.D., Professor of Diseases of the Nervous System in the Marion-Sims-Beaumont College of Medicine, medical department of St. Louis University, St. Louis, Missouri. With an introduction by FREDERICK PETERSON, M.D., President of the New York State Commission in Lunacy. Philadelphia: F. A. Davis Company, 1904.

While this work is essentially one for the careful and advanced student of insanity, certain chapters appeal strongly to the general practitioner. For example, those chapters devoted to the consideration of general therapy are full of important suggestions. The work is largely a clinical one, and contains the histories of 81 cases in detail, illustrating as many different mental states. While Krafft-Ebing acknowledged the existence of hebephrenia, as described by Kahlbaum and Hecker, he did not feel justified in regarding it as a peculiar form of disease. Dementia præcox, as described by Kraepelin, includes hebephrenia, as well as other morbid mental states, and is acknowledged by many alienists as a clinical entity. It is rather surprising, therefore, to find no mention of this symptom-complex, and only a brief mention of hebephrenia in this book. The chapters on the development of psychiatry from ancient times down to the present are valuable and full of interest. This translation is, without doubt, an extremely important addition to the English literature of insanity. It is to be regretted that there is so much fine printed matter in the book. It is quite proper that the details of the cases should be in smaller type than the general text, but when subdivisions of the subject are placed in much finer print than the general text it becomes tiresome, and at times makes the reading laborious.

A Manual of Chemistry.—By ARTHUR P. LUFF, M.D., and FREDERIC J. M. PAGE, B.Sc. Third edition, revised throughout. Chicago: W. T. Keener & Co., 1905.

The third edition of this work brings it up to our present knowledge of chemistry and again makes it a valuable help for students of medicine. The composition of various substances lately coming into use as drugs is furnished under organic chemistry. Though the pages are small, no space is wasted and a great deal of information is crowded into the 538 pages of text.

The Diseases of Society.—By G. FRANK LYDSTON, M.D. Philadelphia and London: J. B. Lippincott Company, 1904.

In this book of 614 pages the author attacks the vice and crime problem in his usual vigorous manner and presents the subject in a way that impresses the reader with the earnestness of his convictions derived from a long study of its various phases. He discusses the principles of evolution in their relation to criminal sociology, the etiology of social diseases in general, the relation to them of neuroses, the chemistry of social diseases, sexual vice and crime, genius and degeneracy, and the therapeutics of social disease with special reference to crime. The influence of the slum in social disease is depicted and special emphasis is put upon the newspaper as a cause. Lydston punctures effectually the "wild oats" theory and shows how often this is responsible for after-lives of crime. Licensing of prostitution or any recognition of it as an institution he regards as abso-

lutely inimical to the welfare of society; he also advocates asexualization of rapists, of whatever color. In the chapter on genius and degeneracy, the author gives a list of persons including Dickens, Burns, George Eliot, Byron, Lamb, Coleridge, Johnson, and Victor Hugo, all of whom showed indubitable evidences of degeneracy; not every one will agree with this. As a whole the book presents in a very forcible, though somewhat rambling manner, topics that are of the greatest importance to society and which are too often overlooked. It is well worth reading by every adult, whether or not he is specially interested in the problems of sociology.

Manual of Chemistry.—By W. SIMON, M.D., Ph.D. Eighth edition, thoroughly revised. Lea Brothers & Co., Philadelphia and New York, 1905.

But little need be said of the eighth edition of a book which has met the favor accorded Simon's Chemistry. It has been delayed for a year in order to incorporate the changes necessitated by the new Pharmacopeia and thus render it of service to students of pharmacy as well as of medicine and dentistry. Many portions of that part dealing with organic chemistry have been practically rewritten. It continues to be one of the sterling works on this subject.

The Principles of Bacteriology.—By A. C. ABBOTT, M.D. Seventh edition, enlarged and revised. Lea Brothers & Co., Philadelphia and New York, 1905.

The seventh edition of this wellknown book includes the later methods in bacteriology which have proved valuable, as well as the recent additions to the science itself. Advances in the domain of infection and immunity are given special importance. The book now contains 674 pages, with 100 illustrations, of which 24 are colored. It well deserves a continuation of the popularity accorded the previous editions.

A Manual on Acute Poisoning and First Aid to the Injured.—By JOHN W. WAINWRIGHT, M.D. A. R. Pelton, New York, 1905.

This little pocket manual is one that may be of some use to the practitioner and one the reviewer should judge of great use to the housewife. The arrangement of the subject is good, the first chapter being devoted to the general principles of treatment, the poisons themselves being well arranged under their special types. The part devoted to "First Aid to the Injured" is very brief and perhaps more attention given to after-treatment, rather than to simple "First Aid," than is warranted.

A Textbook of Diseases of Women.—By CHARLES B. PENROSE, M.D., Ph.D. Fifth edition, revised. Philadelphia, New York, London: W. B. Saunders & Co., 1904.

The fifth edition of Dr. Penrose's wellknown textbook contains many additions which have been rendered necessary by the progress of the specialty. A complete index and 225 illustrations add to the value of the work. The advocates of conservative gynecology will be pleased to note that several pages have been devoted to the pessary and its uses for the treatment of mobile retrodisplacements of the uterus. The author has carefully considered the technic of the special gynecologic operations and has emphasized the necessity for perfect asepsis in all operations. The gynecologist, who is debarred from the use of antisepsis during a peritoneal operation, must rely altogether upon the asepsis of his technic. The general practitioner often forgets that the genital

tract of a woman communicates directly with the peritoneum, and so frequently becomes careless of his asepsis in vaginal and intrauterine manipulation. Penrose emphasizes the fact that just as much care must be taken in minor gynecologic operations as in the major procedures.

Handbook of Anatomy.—By JAMES K. YOUNG, M.D. Second edition, revised and enlarged. F. A. Davis Company, Philadelphia, 1905.

The author has in this manual brought out a work of a larger scope than the quiz-compend, but still fulfilling some of the requirements of the latter. The subject-matter is presented in a clear and concise manner. The illustrations are well chosen, those on the nervous system being particularly so. Those who wish such a type of work on anatomy will find this manual to more than fulfil their requirements.

The Diagnosis of Diseases of Women.—By PALMER FINDLEY, B.S., M.D. Second edition, enlarged and revised. Lea Brothers & Co., New York and Philadelphia, 1905.

The second edition of this work is more complete than the earlier edition. The chapters on special diagnosis referable to the malignant growths, also those devoted to the urinary system, are quite complete and up-to-date. The book, as a whole, is one of high standard and great usefulness, both as a textbook and a reference book. The author may be complimented for adhering in his subject-matter to diagnosis and not wandering off into the realms of operative treatment and technic, so often the faults of works on diagnosis. The book is well illustrated and is graced with a good index.

The Treatment of Diseases of the Eye.—By VICTOR HANCKE. Translated by J. HERBERT PARSONS, B.S., D.Sc., F.R.C.S., and GEORGE COATS, M.D., F.R.C.S. Chicago: W. T. Keener & Co., 1905.

Dr. Hancke's small work contains an epitome of general ophthalmic science, with special reference to the methods of treatment employed in Professor Fuch's clinic. A surprising amount of material has been included in the 220 closely printed pages, and the volume will find a prominent place in the large list of reliable elementary works on ophthalmology. Many of the newer methods are fully described and most of the new remedies are mentioned, bringing the work quite up to date.

The Johns Hopkins Hospital Reports. Volume VII. Baltimore: The Johns Hopkins Press, 1904.

This volume contains 548 pages and includes eight articles: "The Connective Tissue of the Salivary Glands and Pancreas with Its Development in the Glandula Submaxillaris," by J. M. Flint; "A New Instrument for Determining the Minimum and Maximum Blood-pressure in Man," J. Erlanger; "Metabolism during Pregnancy, and the Puerperium," J. M. Slemmons; "An Experimental Study of Blood-pressure and Pulse-pressure in Man," J. Erlanger and D. R. Hooker; "Typhoid Meningitis," R. I. Cole; "The Pathologic Anatomy of Meningitis Due to *Bacillus typhosus*," W. G. McCallum; "A Comparative Study of White and Negro Pelves," T. F. Riggs; "Renal Tuberculosis," G. Walker. All of the articles are thorough and painstaking in character, as are always found in this publication, and hence valuable contributions to the subjects considered.

Memoranda of Poisons.—By THOMAS HAWKES TANNER, M.D., F.L.S. Tenth revised edition by HENRY LEFFMANN, A.M., M.D. Philadelphia: P. Blakiston's Son & Co., 1905.

This is the best concise statement of its subject in the market. The reputation of the editor for accuracy, lucidity, and conciseness prepares us to find these characteristics in the book, and we are not disappointed. As a matter of course, a duodecimo volume of 175 pages is not an extensive treatise upon toxicology, and the title of the book indicates as much. Physicians and pharmacists need just such a brief, trustworthy guide for reference and refreshment of memory in emergencies.

Studies of the Psychology of Sex.—By HAVELOCK ELLIS. F. A. Davis Company, Philadelphia, 1905.

In this volume Ellis gives the results of his studies of the sensations of touch, smell, hearing, and vision in relation to the psychology of sex. This work represents the first of five volumes, in which the various phases of the subject will be treated. Some interesting, although perhaps not very important, conclusions are summarized. In works treating of the sexual life there is a tendency to appeal to the interest of the reader in a somewhat morbid manner. This book is, in the main, rather free from this objection, although in the appendix there are a number of histories of psychopathic conditions, in which the cases are given in too great detail. The scientific value of the cases would not suffer if, in relating the histories, the author had appealed less to the morbid imagination of the reader. On the whole, the book is well written, and will be found most interesting.

Legal Medicine.—By FRANK W. DRAPER, A.M., M.D. Fully illustrated. W. B. Saunders & Co., Philadelphia, New York, London, 1905.

Dr. Draper's experience of 26 years as medical examiner of Boston (during which time the causes of 8,000 deaths were investigated), together with his long experience as a teacher, have eminently fitted him to write a book on legal medicine. The work is an excellent one, and he ably discusses the various questions which arise in medicolegal medicine. It is to be regretted that he has omitted chapters on toxicology and the medicolegal relations of insanity, as no textbook on legal medicine is complete without these. The chapter on the medicolegal relations of human blood is unusually good. Dr. Draper takes the conservative view of the value of the serum test for blood in medicolegal examinations. This work is a valuable one to the general practitioner and to the medical student, who will find the subject (with the two exceptions above stated) fully and clearly described.

A Manual of the Diseases of Infants and Children.—By JOHN RUHRÄH, M.D. Philadelphia, New York, and London: W. B. Saunders & Co., 1905.

Dr. Ruhräh has outlined the therapeutics of infancy and childhood in a way that cannot fail to make for this work a place of first importance in its field. Explicit instructions for dosage and prescribing are given, and a number of useful prescriptions are appended. The subject of infant feeding is taken up in detail. A very valuable feature consists in the many references to pediatric literature, so selected as to be easily accessible by the student, enabling him to ascertain the sum of knowledge on any given disease. The volume is of service to the busy practitioner, but it is of special value to the student, enabling him to grasp quickly the more important parts of the subject of pediatrics, and furnishing him with a rapid reference book for clinical use.

Manual of Psychiatry.—By J. ROUGES DEFURSAC, M.D. Authorized translation from the French by ROSANOFF, M.D. First edition. New York: I. Wiley; London: Chapman & Hall, Limited, 1905.

DeFursac has employed the classification of Kraepelin with some modifications. Before discussing the different varieties of insanity the author treats in a general way the etiology, symptomatology, method of examination, and therapeutics. The subject is briefly and clearly treated, and the work will be found most useful to the general practitioner and the medical student. In the translation the French insanity law has been wisely omitted, and the translator has introduced some clinical records from cases at the Long Island State Hospital, at King's Park, New York, as satisfactory translation of the French cases was not possible. The print is unusually good and clear, and generally the book is published in a most creditable form.

BOOKS RECEIVED.

[Prompt acknowledgment of books received will be made in this column, and from time to time critical reviews will be made of those of interest to our readers.]

Surgical Diagnosis.—By ALBERT A. BERG, M.D., Adjunct Attending Surgeon to Mt. Sinai Hospital, New York. In one 12mo volume of 543 pages with 215 engravings and 21 full page plates. Cloth, \$3.25 net. Lea Brothers & Co., Philadelphia and New York.

Physical Diagnosis.—By EGBERT LEFEVRE, M.D., Professor of Clinical Medicine and Therapeutics in the University and Bellevue Hospital Medical College, Attending Physician to Bellevue Hospital and to St. Luke's Hospital, New York. New second edition, thoroughly revised and much enlarged. In one 12mo volume of 479 pages with 102 engravings and 6 full page plates in black and colors. Cloth, \$2.25 net. Lea Brothers & Co., Philadelphia and New York.

Pathogenic Microorganisms: A Manual of Pathogenic Microorganisms, including Bacteria and Protozoa.—By WILLIAM HALLOCK PARK, M.D., Professor of Bacteriology and Hygiene in the University and Bellevue Hospital Medical College, and Director of the Research Laboratory of the Department of Health, New York. New second edition, enlarged and thoroughly revised. In one octavo volume of 556 pages, with 165 engravings and 4 full page plates in black and colors. Cloth, \$3.75 net. Lea Brothers & Co., Philadelphia and New York.

Faulty Diction.—By THOS. H. RUSSELL, LL.B., Editor-in-Chief of Webster's Imperial Dictionary. Geo. W. Ogilvie & Co., Chicago, Ill.

The Medical Society of the Borough of the Bronx. October, 1905.

Old Lamps and New, and Other Verse.—By EDWARD WILLARD WATSON, M.D. H. W. Fisher & Co., Philadelphia.

The Blues (Splanchnic Neurasthenia): Causes and Cures.—By ALBERT ABRAMS, A.M., M.D. (Heidelberg), F.R.M.S., Consulting Physician, Denver National Hospital for Consumptives, etc. Illustrated. Second edition, enlarged. E. B. Treat & Co., New York, 1905. Price, \$1.50.

Radiotherapy in Skin Diseases.—By DR. J. BELOT, with a preface by DR. L. BROCC, Physician to Broca Hospital, Paris. Translated by W. DEANE BUTCHER, M.R.C.S., Surgeon to the London Skin Hospital. Only authorized translation from second French edition. With 13 plates and 28 illustrations. Rebman Company, New York and London, 1905.

Gumption: The Progressions of Newson New.—By NATHANIEL C. FOWLER, JR. Small, Maynard & Co., Boston, 1905.

Progressive Medicine: A Quarterly Digest of Advances, Discoveries, and Improvements in the Medical and Surgical Sciences.—Edited by HOBART AMORY HARE, M.D., Professor of Therapeutics and Materia Medica in Jefferson Medical College of Philadelphia, etc. Assisted by H. R. M. LANDIS, M.D., Visiting Physician to the Tuberculosis Department of the Philadelphia Hospital, etc. Vol. iv, December, 1905. Lea Brothers & Co., Philadelphia and New York, 1905. Price, \$6.00 per annum.

Annual Report, Bureau of Health, Philadelphia, 1904. Dunlap Printing Company, Philadelphia, 1905.

Year Book of Legislation.—Edited by ROBERT H. WHITTEN, Sociology Librarian, New York State Education Department, Albany, 1905. Price, \$1.00.

Organotherapy.—By H. BATTY SHAW, M.D. (London), F.R.C.P., Lecturer in Therapeutics, University College, London, etc. Illustrated. W. T. Keener & Co., 1905. Price, \$1.75 net.

AMERICAN NEWS AND NOTES

GENERAL.

Havana Free of Yellow Fever.—According to official report, the last case of yellow fever has disappeared from Havana, and there are no suspicious cases under observation.

Patent Medicines in the British Provinces.—Owing to the death at Victoria (British Columbia) of an infant from laudanum contained in a patent medicine, the Provincial Government has appointed a commission to investigate the sale of such medicines.

Leprosy in the Philippines.—A recent monthly report of the Board of Health of the Philippine Islands cites the fact that a total of 3,683 lepers is now living in the archipelago. They are scattered throughout the various provinces, Cebu, with 675 afflicted, having the largest number. Only one province is entirely free from the disease.

An Appointment to the United States Leper Sanatorium.—Dr. Walter R. Brinckerhoff, instructor in pathology at the Harvard Medical School, has been offered the position in Hawaii to take charge of the United States leper sanatorium, which is to be established there. He graduated in the Harvard Medical School in 1902, and is only 27.

Philippine Board of Health.—The monthly reports reach this country nearly three months after publication in Manila, but are unusually worth study for data. The prevention of smallpox is one of the tasks that keeps them busy, and a systematic distribution of vaccine virus is carried on. Between June 30 and August 1 there were distributed in Manila and 21 provinces 190,150 units of vaccine virus.

Assistant Surgeoncies Vacant.—There are 24 vacancies in the junior grade of the medical department of the army, and an additional vacancy will occur by virtue of the resignation of Lieutenant James F. Edwards during the present week. The next examination of candidates for appointment as assistant surgeon in the army will take place on April 1 or May 1. About that time also there will be commissioned as permanent officers in the corps the 17 provisionally accepted candidates who passed the examination last year and who are under instruction in Washington.

United States Pharmacopoeial Business Affairs.—An edition of the Pharmacopoeia in the Spanish language will no doubt be one result of the recent meeting. A committee consisting of Professor J. P. Remington, chairman of the Committee of Revision; Charles E. Dohme, chairman of the Board of Trustees; and Dr. H. O. Wood, president of the United States Pharmacopoeia Convention, was appointed to make the preliminary arrangements for an edition of 2,000 copies. With a view of bringing the Pharmacopoeia to the direct attention of medical students, it was decided to present to the professors of *matéria medica* in the medical colleges complimentary copies.

The American Association for the Advancement of Science has decided upon a special meeting at Ithaca, N. Y., on June 28, and the next regular meeting in New York City December 27, 1906. The following officers were elected by the general council: President, W. H. Welch, of Baltimore; vice-presidents—section on mathematics and astronomy, Edward Kasner, of New York; physics, W. C. Sabine, of Cambridge, Mass.; chemistry,

Clifford Richardson, of New York; engineering, W. R. Warner, of Cleveland; geology, A. C. Lane, of Lansing, Mich.; sociology, E. C. Conklin, of Philadelphia; botany, Daniel T. McDougall, of Washington; anthropology, Hugo Munsterberg, of Cambridge, Mass.; social and economic science, C. A. Conant, of New York; physiology and experimental medicine, Simon A. Dexter, of New York.

The National Association for the Study and Prevention of Tuberculosis.—Announcement is made by the Board of Directors of the National Association for the Study and Prevention of Tuberculosis of the preliminary arrangements for the second annual meeting of the association, which will be held in Washington, May 17, 18, and 19, 1906. Two new sections have been established, one on surgical tuberculosis and the other on tuberculosis in children. The officers of the sections are as follows: Sociologic Section: Chairman, Mr. William H. Baldwin, Washington, D. C.; secretary, Miss Lillian Brandt, New York. Clinical and Climatologic Section: Chairman, Dr. Vincent Y. Bowditch, Boston, Mass.; secretary, Dr. Edwin A. Locke, Boston, Mass. Pathologic and Bacteriologic Section: Chairman, Dr. Edward R. Baldwin, Saranac Lake, N. Y.; secretary, Dr. Hugh M. Kinghorn, Saranac Lake, N. Y. Section on Surgical Tuberculosis: Chairman, Dr. W. W. Keen, Philadelphia, Pa.; secretary, Dr. Robert G. LeConte, Philadelphia, Pa. Section on Tuberculosis in Children: Chairman, Dr. W. P. Northrup, New York; secretary, Dr. Roland G. Freeman, New York.

Miscellaneous.—Dr. Alexander Graham Bell has given \$75,000 to the Volta Bureau, of Washington, D. C., as a memorial to his father, Prof. Alexander Melville Bell. The bureau was established by Dr. Bell with the object of increasing the diffusion of knowledge relating to the deaf and dumb.—Dr. John Nicholas Mitchell, of Philadelphia, was provisionally elected secretary of the State Lunacy Commission. The provision is that he resign from the State Board of Charities, of which he is now a member. He is also a member of the Lunacy Commission. The election was to fill the vacancy made by the recent death of George I. McLeod. The position pays \$3,000 a year. He was graduated from the University of Pennsylvania and later from Hahnemann Medical College. From 1888 until 1895 he was professor of obstetrics in Hahnemann Medical College. He has been a member of the State Board of Charities since 1903.—Anne E. Peale, of Philadelphia, made the following charitable bequests: To the Pennsylvania Hospital, \$5,000, to endow a free bed for a female patient in the department of the insane. To the Friends' Asylum for the Insane, at Frankford, \$7,000.

Uniformity in Naval and Military Medical Equipment.—The Surgeon-Generals of the Army and of the Navy have suggested that a joint board be convoked for the purpose of adjusting the methods and establishing uniformity in the equipment of the medical branches of the naval and military services. Many medical officers of both services take a keen interest in the proposition and it is understood that President Roosevelt has already expressed his sympathy with the movement. It is likely the joint board, composed entirely of medical officers of the Army and Navy, will soon be ordered to meet in Washington. It is realized that there should be greater uniformity in medical equipment. This is regarded as fully as important as equipping the armed forces of the country with identical types of weapons and ammunition, and the same rules which argue in favor of uniformity in that class of equipment apply with equal directness to the equipment and training of the medical departments of the army and navy. The board will give special attention to the subject of

unification of duties, the education of line officers in ship, camp, and field sanitation, and the special instruction of the enlisted men, notably in the application of the first-aid dressings. It is proposed to bring before the board new methods which have been suggested from various sources, to try the devices recommended at different times, and to work out the plans of organization. It is probable that the joint medical board will be required to work in conjunction with the naval general board and the army general staff, and says the *Army and Navy Register*, it is destined to have a far-reaching and eminently practical effect upon military and naval administration generally, and to lead to a better, because more efficient, equipment of the medical departments.

EASTERN STATES.

Massachusetts Hospital for Epileptics.—The trustees have submitted their annual report for the year ending September 30, 1905, from which the following statistics are taken: Number of patients September 30, 1904, 459; since admitted: sane (8 from visit, 3 from escape), 102; insane (5 from visit, 2 from escape), 57; total, 618; discharged and on visit: sane—much improved, 12; improved, 10; not improved, 18; died, 11; on visit, 15; escaped, 2; total, 63; insane—recovered, 1; much improved, 1; improved, 5; not improved, 2; died, 18; transferred, 4; on visit, 7; escaped, 1=34; total, 97; number of patients remaining September 30, 1905, 521; daily average of patients, 490.23; per capita cost (for week), \$4.56.

Milk Commission Proposed.—A committee which was appointed on December 20 reported to the meeting of the Suffolk branch of the Massachusetts Medical Society that a milk commission should be appointed for Boston. This commission should consist of five members, says the report, appointed from physicians who are members of the Suffolk branch of the society, said committee to be empowered to furnish experts in veterinary matters and in bacteriology, free of charge, the experts to give certificates to producers and dealers whose plants or premises are found to be in accordance with all proper requirements. It is believed that many producers and dealers will be glad to meet the requirements in order to obtain the proposed certificate of pure milk which the commission will have the power to grant. Discussion of the report was postponed to a general meeting on April 30.

White River, Vt., Medical Association has adopted a resolution that after January, 1906, no member of the association shall accept the position of club, society, or organization physician, or agree to do any medical or surgical work for any club, society, or organization at a less rate than the regular or customary charges for like services rendered by other physicians in the same locality for patients not members of club, society, or organization; also that in no case shall any physician agree to attend the families of the members of such club, society, or organization at half price or a less price than the regular rate. Nothing in this resolution shall be construed as preventing any member from attending the worthy poor at a less rate or to give free service to those who are too poor to pay anything. Any violation of this by-law shall be considered unprofessional conduct, and it shall be the duty of the censors to expel such member from the association, when proof of such conduct shall be presented to them.

NEW YORK AND VICINITY.

The Harvey Society.—The fifth lecture in the Harvey Society Course will be given by Prof. W. H. Park at the New York Academy of Medicine on January 20, at 8.30 p.m. Subject: "A Critical Study of Serum Therapy."

Hospital on Steamship Brasile.—The new steamship Brasile of La Voce Line will arrive at New York on January 12, and be placed in the New York-Mediterranean service. The vessel has a hospital with 50 beds, an ambulatory and operating room, a pharmacy, a disinfecting apparatus, and a complete service of hot and cold baths.

The Health of New York.—The Board of Health report for last week last showed 357 cases of contagious diseases in the city. Of this number there were 206 cases of measles. There were 123 in Brooklyn, and 62 in Manhattan. Because the institution had been quarantined on account of measles, the authorities of the Hebrew Infant Asylum, 907 Eagle Avenue, Bronx, had to turn away a child suffering from pneumonia.

New York Neurological Society.—At the annual meeting, held on January 2, 1906, the following officers were elected for the ensuing year: President, Dr. Joseph Fraenkel; first vice-president, Dr. Adolf Meyer; second vice-president, Dr. J. Ramsay Hunt; recording secretary, Dr. Edwin G. Zabriskie; corresponding secretary, Dr. F. K. Hallock; treasurer, Dr. G. M. Hammond; councillors, Drs. M. Allen Starr, Charles L. Dana, Joseph Collins, J. Arthur Booth, and William M. Leszynsky.

Yerkes Hospital in Bronx.—The great hospital provided for in the will of the late Charles T. Yerkes, the traction promoter, who died in New York City last week, will be built at once. It will be located in the borough of the Bronx. This announcement is made by Dr. J. E. Janrin, who says that a beginning will be made just as soon as the estate of Mr. Yerkes is settled, instead of waiting until after Mrs. Yerkes' death, as provided in the will. The projected hospital is entirely Mrs. Yerkes' own idea.

The Committee on the Prevention of Tuberculosis of the Charity Organization has sent out a large number of letters to the medical profession of the city of New York calling attention to the consequences arising from the practice of sending the poor tuberculous to such States as Arizona, Colorado, and California. Extensive experience has taught us that, difficult as it may be for a poor man to recover from tuberculosis in New York, he is better off among his friends and relatives, where there are more adequate hospital and dispensary facilities, than he is far from home, where he is thrown entirely upon his own resources and where the great number of tuberculous willing to work at the lowest wages make the finding of employment, especially of suitable employment, almost impossible. Favorable results from climate can hardly be looked for unless at least \$10 per week can be spent for board and lodging. The stranger, who has spent a large part of his savings on railroad fare, soon finds himself without work, living in the poorest rooms, eating the scantiest and cheapest foods. The practice of advising the removal to other climates thus defeats its own aims and casts upon the charity of other communities a burden which they should not and cannot sustain. The committee invites the cooperation of the medical profession in preventing persons suffering from tuberculosis from being sent to other States unless (a) they are physically able to work and have secured in advance a definite assurance of the opportunity to perform work of a proper character at wages sufficient for their suitable support; or (b) unless they have at their disposal at least \$250 in addition to railroad fare.

PHILADELPHIA, PENNSYLVANIA, ETC.

The new maternity building of the Presbyterian Hospital was dedicated last week with religious services. The cost of the building, which is a four-story brick structure, was paid with a gift of \$42,670 from an anonymous friend of the hospital. The money was given in

1902. The new department of the hospital is thoroughly equipped with every modern convenience, including operating room, six private bedrooms and ten ward beds.

SOUTHERN STATES.

Vaccinating Party in Baltimore.—Owing to the discovery of a case of smallpox on Bruce street, in the negro quarter, 28 physicians and two police sergeants with a squad of men were sent to the spot and vaccinated nearly 500 negroes who had been exposed to the infection.

The Smith County (Texas) Medical Society has changed its method of work and will begin giving a series of monthly postgraduate courses in medicine, to which every physician in the county is cordially invited. The first program is: Clinic on Tuberculosis, G. G. Bell, J. C. Smith, and A. B. Garland; Clinic on Heart Diseases, J. S. Christian, W. A. Crook, and J. C. Davis; Clinic on Diseases of Kidneys, A. S. Jarvis, W. W. Shoemaker, and Albert Woldert; Clinic on Diseases of the Skin, A. P. Baldwin, Mitch Walker, and W. R. Johnson.

WESTERN STATES.

"The Alkaloidal Clinic," beginning with the January issue, has changed its name to *The American Journal of Clinical Medicine*. Several additions have been made to the editorial force.

Park Sanatoriums for Chicago.—The establishment of tent sanatoriums for the care of infants in each of the small parks in the city is to be a feature of next summer's philanthropic work in Chicago.

Bovine Tuberculosis.—All the cattle have been removed from Angel Island, near San Francisco, by order of General Funston, commanding the Department of California, because 50% of the animals were found to be affected with tuberculosis.

Ohio State Board Aiding Physicians.—The Ohio State Board of Health has extended its field of usefulness by undertaking bacteriologic examinations free of charge to physicians. Sputum of suspected tuberculous individuals and diphtheria and typhoid fever material may be presented for examination, but the privilege does not extend to physicians in whose cities the Board of Health maintains a laboratory.

FOREIGN NEWS AND NOTES

GENERAL.

Paper versus Slates.—English educational and sanitary authorities are discussing the advisability of substituting cheap paper and pencils for slates in schools. The *Lancet* is strongly in favor of paper and pencils.

The Relation of Population in Ireland.—According to the annual report on births, deaths, and marriages in Ireland during 1904, the natural increase of population recorded, or the excess of births over deaths, was 24,298. The loss by emigration amounted to 36,902.

A New Hospital for Vienna.—Vienna is considering the establishment of a hospital, which will cover about 2,400,000 square feet of ground and cost in the neighborhood of \$8,000,000. The institution will comprise 40 buildings which will be utilized for clinical and

hospital purposes, and offices and residences for the staff. There will be 2,300 beds and each patient will be allowed about 1,000 square feet of space.

The Health of London.—During last week 1,460 deaths were registered, including measles, 45; scarlet fever, 13; diphtheria, 21; whoopingcough, 25; enteric fever, 4; and 14 from diarrhea. The deaths from all causes correspond to an annual rate of 16.3 per 1,000. In Greater London 1,996 deaths were registered. In the "outer ring" the deaths included 6 from diphtheria, 5 from measles, 3 from whoopingcough, and 1 from diarrhea.

Annual Deathrate of Ireland.—The average annual deathrate represented by the deaths registered during the week ended December 9, 1905, in the 21 principal town districts of Ireland was 20.5 per 1,000 of the population, which was estimated at 1,093,959. The lowest rate was recorded in Newry, viz., 4.2, and the highest in Newtownards, viz., 28.6 per 1,000. In Dublin and suburbs 168 deaths were registered, including diphtheria, 1; enteric fever, 2; scarlet fever, 1; whoopingcough, 2; and 28 from tuberculosis.

Contagion in School Books.—A discussion of interest has taken place in the French Academy of Medicine on the subject of class books as disseminators of contagion in schools, especially in the case of such diseases as scarlet fever, measles, and diphtheria. Paper has long been recognized as a dangerous agent of infection, even in tuberculosis, owing to the habit among children of turning over leaves with fingers wetted with saliva. Dr. Lop, in order to test the extent of danger in school books, made long experiments to establish the duration of infective power in various bacilli, finding it to range from 48 hours for some to 50 days for the Eberth, and 103 days for the Koch bacillus. General agreement was expressed as to the importance of thorough disinfection of school materials.

Physicians Go on Strike.—According to the *London Express*, the entire staff of medical men attached to the Exeter Dispensary have decided to strike. Insults, they declare, have been heaped on them and "the profession of medicine degraded by the base calumnies of the committee." The trouble has arisen from a proposal by the committee to appoint a paid medical officer. In 1886 the medical staffs of the hospitals of Rome decided to strike on a certain day. When the day arrived each physician received from the Ministry of War a commission in the army, with orders to report for service to general officers who had simultaneously been appointed to take charge of the various hospitals. In these circumstances a strike would have been "mutiny." There was no mutiny among the new members of the Italian army's medical staff.

Women in Medicine in Germany.—The *Deutsche medicinische Wochenschrift* reports that the fears entertained some years ago, when women were admitted to the study of medicine at the German universities, that they would in the course of time prove serious rivals to male practitioners, have been proved unfounded. Official statistics, as well as the special investigations of Dr. Johanna Maass, have shown that, since the year 1900, only 46 women have been admitted to practice in Germany, and only 6 have become dentists. Only 31 women physicians could still be traced, and of these 9 are found in Berlin; of the 6 women dentists only 1 is in the capital city. Of the 31 reporting, 24 confine their practice to women and children, 4 are specialists, and 3 are assistants at medical institutes. State examinations were taken by these women in 11 university towns, and 30 took academic degrees. Four are married.

OBITUARIES.

Thomas Clifford Potter, aged 59, January 7, from heart disease, at his home in Philadelphia. He was graduated from the University of Pennsylvania, in 1871. He was consulting physician to the Germantown Hospital for several years.

Frank M. King, aged 45, of Damascus, Ohio, committed suicide at the home of his brother-in-law in Alliance, Ohio, January 3. He was graduated from the Eclectic Medical Institute, Cincinnati, Ohio, in 1892.

Daniel Meigs Webb, aged 84, January 1, at his home in Madison, Conn. He was graduated from Yale Medical School, in 1849. He was one of the oldest practitioners in New Haven County.

Harriet N. F. Cooke, aged 75, January 6, from apoplexy, at her home in New York City. She was graduated from the New York Medical College and Hospital for Women, in 1868.

Charles E. Wentz, aged 28, January 2, from typhoid fever, at his home in New Providence, Pa. He was graduated from the Medico-Chirurgical College, Philadelphia, in 1902.

David R. Davis, January 5, at his home in Lansford, Pa. He was graduated from the University of Pennsylvania, department of medicine, in 1893.

Thomas W. Simmons, January 1, at his home in Hagerstown, Md. He was graduated from Jefferson Medical College, Philadelphia, in 1861.

H. Eugene Park, aged 56, January 8, from Bright's disease, at his home in Somerville, N. J.

FOREIGN.—**James Stewart**, recently, in Africa. Dr. Stewart went to Africa as a missionary. He was impressed with the importance of medical knowledge in this work and returned to his native country (England) and took the degree of M.D. From 1856 he was connected with the work at Lovedale in Kaffraria, and also started a mission in memory of Livingstone in Central Africa.

THE PUBLIC SERVICE

Changes in the Medical Corps of the U. S. Army for the week ended January 6, 1905:

Lieutenant-Colonel **WILLIAM B. DAVIS**, deputy surgeon-general, leave granted December 16 is extended two months.—**JOHN R. HEREFORD**, contract surgeon, is relieved from further duty in the Philippines Division, and upon the expiration of his present leave will proceed to Fort Moultrie for duty.—**GEORGE H. JONES**, contract surgeon, orders of December 20 are revoked. Upon the expiration of his present sick leave will proceed to his home, Toledo, O., for annulment of contract.—**HARRY L. REITER**, sergeant first class, Madison Barracks, about January 15 will be sent to Fort Myer for duty.—**HUGO C. RIETZ**, dental surgeon, is granted leave for twelve days from about December 24.—Captain **WILLIAM F. LEWIS**, assistant surgeon, is assigned to duty as attending surgeon and examiner of recruits in Chicago, Ill.—So much of orders, September 11, as directs First Lieutenant **JAMES I. MABEE**, assistant surgeon, to proceed to the Philippine Islands on the transport to sail from San Francisco, Cal., January 5, is so amended as to direct him to report for duty as surgeon of the transport *Sheridan* during the next voyage of that vessel to Manila, P. I.—So much of orders, November 8, as directs Captain **HENRY S. GREENLEAF**, assistant surgeon, to proceed to the Philippine Islands on the transport to sail from San Francisco, Cal., on January 25, is so amended as to direct him to report for duty as surgeon of the transport *Sherman* during the next voyage of that vessel to Manila, P. I.—First Lieutenant **JACOB M. COFFIN**, assistant surgeon, leave

granted December 16 is extended 15 days.—First Lieutenant **EDWARD M. TALBOTT**, assistant surgeon, leave granted December 23 is extended one month.—**GEORGE B. TUTTLE**, contract surgeon, is relieved from duty in the Philippines Division, to take effect at such time as will enable him to comply with this order, and will proceed on the transport to sail from Manila, P. I., about February 15 to San Francisco, Cal., and report by telegraph to the military secretary of the army for further orders.—**ROBERT B. IRVING**, sergeant first class, Fort Columbus, will be sent to San Francisco, Cal., for duty aboard the transport *Sheridan*.—**HARRY A. DAVIS**, sergeant first class, Fort Myer, immediately after reenlistment in the hospital corps, will be sent to New York city for duty aboard the transport *Kilpatrick*.—**ALDEN CARPENTER**, dental surgeon, is granted leave for one month from January 1.—**WILLIAM H. BROOKS**, assistant surgeon, the advancement from the grade of first lieutenant to that of captain with rank as captain from January 1, 1906, is announced.—Captain **HENRY PAGE**, assistant surgeon, is relieved from duty in the Philippines Division, to take effect at such time as will enable him to comply with this order, and will proceed on the transport to sail from Manila, P. I., about March 5, to San Francisco, Cal., and report by telegraph to the military secretary of the army for further orders.

Changes in the Medical Corps of the U. S. Navy for the week ended January 6, 1906:

R. A. CAMPBELL, acting assistant surgeon, appointed acting assistant surgeon from January 9, 1906.—**G. G. HART**, acting assistant surgeon, appointed acting assistant surgeon from January 10, 1906.—**W. N. BLOCK**, acting assistant surgeon, appointed acting assistant surgeon from January 12, 1906.—**C. G. HERNDON**, medical inspector, having been examined by a retiring board, and found incapacitated for active service on account of disability incident thereto, is retired from active service, from December 15, 1905, under provision of section 1453, revised statutes.—**J. F. MURPHY**, assistant surgeon, ordered to naval recruiting station, Omaha, Neb., January 24.—**C. K. WINN**, acting assistant surgeon, detached from naval recruiting station, Omaha, Neb., January 24, and ordered to the naval hospital, Washington.—**J. T. MILLER**, acting assistant surgeon, appointed acting assistant surgeon from January 9, 1906.—**L. O. SCHETKY**, pharmacist, appointed pharmacist December 27, 1905.

Changes in the Public Health and Marine-Hospital Service for the week ended January 3, 1906:

R. L. WILSON, passed assistant surgeon. Bureau letter of December 1, 1905, granting Passed Assistant Surgeon Wilson fifteen days' leave of absence amended so as to grant thirteen days' leave only.—**T. D. BERRY**, passed assistant surgeon, directed to proceed to Tampa Bay Quarantine, Mullet Key, Florida, and assume command of the Service, relieving Assistant Surgeon **R. E. Ebersole**.—**B. J. LLOYD**, assistant surgeon, assigned to duty in the office of the United States Consulate at Guayaquil, Ecuador.—**W. M. WIGHTMAN**, assistant surgeon, relieved from duty at San Francisco Quarantine Station, and directed to proceed to Callao, Peru, for duty in the office of the United States Consulate.—**R. LYALL**, acting assistant surgeon, granted three days' leave of absence from December 26, 1905, under paragraph 210 of the regulations.—**GEORGE NEVES**, pharmacist, granted leave of absence for nineteen days from January 1, 1906.

Board Convened.—A board of officers was convened to meet at the Bureau December 28, 1905, for the purpose of making a physical examination of an officer of the Revenue Cutter Service. Detail for the Board: Assistant Surgeon-General **J. W. Kerr**, chairman; Assistant Surgeon **J. W. Trask**, recorder.

CLINICAL NOTES AND CORRESPONDENCE

[Communications are invited for this Department. The Editor is not responsible for the views advanced by any contributor.]

THIRTEEN LETTERS AND TWO NEWSPAPER CUTTINGS.

BY

EDMUND F. L. JENNER,
of Digby, N. S.

(1) ST. ETHELREDA'S HOSPITAL, N. Y.

DEAR DOCTOR LEE:—I have examined your daughter, and I regret to say that I can only confirm your family physician's diagnosis. Her left lung is affected, but not very badly, the right lung is perfectly sound, and if she takes care of herself, she may outgrow the trouble completely. I have written Dr. Saunders, acknowledging the receipt of his letter, and I will write him again, outlining the course of treatment I advise. Now I have recommended a winter at ———, and it is somewhat an expensive place to stay at. I am well known to the Superintendent of that institution, and if you decide to send your daughter there, I will write him, and ask that she be taken on special terms. She may find the discipline irksome at first, but she will soon get used to it, and I have every reason to believe that she will return to you in far better health.

With kindest regards to your wife.

Yours very sincerely,
ALFRED MCGEE.

To the Rev. John Lee, D.D., Morrhuopolis, New Brunswick, Canada.

(2) ST. ETHELREDA'S HOSPITAL, N. Y.

DEAR DOCTOR:—If you receive a letter from one John Lee, of Morrhuopolis, Canada, relative to the treatment of his daughter in your institution, please give her the best room you have, and cut the price in two. Send me the bill for one half, and I will settle with you. I take a great interest in the case, as Dr. Lee was very kind to me when I was a boy, in fact, he coached me for my preliminary examination, and did not charge me a cent for it. I imagine his congregation pays him something like \$700.00 a year, and he has to keep his family on that, and it would be almost impossible for him to send the girl to a sanatorium without aid. The family history is a bad one, two aunts on the mother's side dead of tuberculosis, and her father's mother also died from the same cause. Make your charge on the old doctor as light as you possibly can, let her have everything necessary, and send me your bill for the balance, and oblige,

Yours fraternally,
ALFRED MCGEE, M.D.

P. S.—I expect to send you two patients about the first of next month. One of them is a hard case, the other you will have no difficulty in pulling through. I will send details later.

(3) THE ——— SANATORIUM, MAINE.

DEAR DOCTOR MCGEE:—I have heard from your friend, and I wrote him a pious lie about a partially endowed room being vacant. He is to pay \$8 per week, and I will make draft on you for the balance, from time to time.

Yours truly,
JOHN SCOTT, M.D.,
Superintendent.

(4) THE ——— SANATORIUM, MAINE.

MY DEAR MOTHER:—I received your letter yesterday, and though it was only a fortnight yesterday since

I left home, it seems a year. You ask me how I like this place. I cannot say that I like it very much, it is almost like being in prison. You have to get up early, go out of doors in all sorts of weather, eat all kinds of horrid things—and you *must* eat them, too, and then you have to go to bed early, just as you begin to enjoy yourself. They make you sleep with all the windows open, and they do not let me have a feather bed. You know how I hate hard beds, and cold of any kind. My cough is better, but I will never believe that there was anything wrong with me. Doctor Scott is very kind, but I am very homesick.

Your loving daughter,
MARY.

(5) ST. ETHELREDA'S HOSPITAL, N. Y.

DEAR DOCTOR LEE:—Dr. Scott writes me that your daughter has improved in a marked degree since she came under his treatment. She has gained nearly eight pounds, her temperature has fallen considerably, and she is in every way better. I notice that she is somewhat impatient of restraint, and does not like the compulsory out-of-door life. You must use your influence with her to tolerate these things. They are done for her good, and if she perseveres in following Dr. Scott's treatment she will be practically cured by the first of next June—barring accidents.

Yours very sincerely,
ALFRED MCGEE.

(6) CHICAGO.

DEAR MADAM:—A mutual friend of ours has informed me that your daughter is an inmate of the ——— Sanatorium, Maine.

You will see by my letterhead that I have made a specialty of tuberculous cases for over 30 years, that I have invented the only reliable cure for that disease known to the world, and, by reference to almost any paper, you will see that I am spending thousands of dollars every year in advertising the fact to the people of the United States and Canada.

You are no doubt aware that the physician who sends a patient to one of these so-called sanatoriums receives a bonus from the proprietor in every case. This accounts for the extortionate charges for board, treatment, and medicine. My correspondent informs me that you are paying \$8 a week for your daughter's board alone; of that sum a quarter, or possibly a third, goes to the doctor who sent her there, as his commission.

For \$10 a month, or possibly less, I can furnish her with the treatment that has cured hundreds of people—Senators, Congressmen, bishops, ladies who are prominent in the Women's Christian Temperance Union, actresses, for the sun shines on the just and the unjust alike—and it is my duty to cure all the sick who appeal to me, irrespective of their profession. I enclose copies of testimonials, and I hereby agree to forfeit \$1,000 for each and every one which is not genuine. If she decides to take my treatment she will be under your own supervision, free from the irritating restraint so often imposed on the inmates of "sanatoriums;" her diet will be practically unrestricted, and she will enjoy the advantages of home life combined with the best medical advice (free of charge) and the best medical treatment the world can afford her.

I have no desire to foist my services upon you, but I think it is my duty to inform you of my ability to cure tuberculosis.

Trusting that you will pardon the liberty I have taken,
Yours for health,

ANDREW A. SCOOPER, M.D.,
President Scooper Medical Institute, Chicago, Ill.,
U. S. A.

(7) ST. JOHN'S RECTORY, MORRHUOPOLIS.

DEAR ALFRED:—I deeply regret to say that Mrs. Lee has decided to remove Mary from Dr. Scott's sanatorium. I have said all I could to prevent it, but in vain. The child—for she is nothing else—is very impatient of restraint. She imagines she is perfectly cured, and her mother says she will derive no benefit from a prolonged stay in an institution she detests.

I could have kept her there for a year, thanks to you, for the most reasonable terms you procured for her, but she and her mother are against me, and I cannot withstand them both. I regret to say that my wife has no confidence in Dr. Saunders—I regard him as an especially able man for a country practitioner.

She has been corresponding with a Dr. Scooper, of Chicago, who claims to be a specialist on tuberculosis. Do you know him? Perhaps you have met him, as you are both interested in the same subject.

With very, very many thanks for your kindness,

Your very sincere friend,
JOHN LEE.

(8) EXTRACT FROM A REPLY TO THE FOREGOING.

"I do not know Dr. Scooper, nor have I any wish to see him, unless the State of Illinois sees fit to install a public pillory, and place him, and some dozens more like him, therein. Your own sense will convince you of the fact that it is impossible for anyone resident at a distance of two thousand miles from the patient to treat any case of tuberculosis."

(9) ST. JOHN'S RECTORY, MORRHUOPOLIS.

DEAR DR. SCOOPER:—My daughter has finished, or nearly finished, the course of treatment you sent her three weeks ago. She seems very bright and cheerful, her appetite is fair, and her color has come back. She has lost in weight slightly, but she attributes this to her having discarded her heavy winter clothes. Enclosed please find postal order for \$10, for which please send me another course of treatment. Kindly address it to Mrs. Hill, Milliner, Main street, Morrhupolis, as I regret to say that Dr. Lee is not in favor of your treatment.

Yours truly,
CATHERINE LEE.

(10) CHICAGO.

DEAR MADAM:—I am in receipt of your letter of the 6th inst. and in reply, I am sending another course of treatment. By reference to my books, I find that this is the sixth. The slight hemorrhage you mention should not occasion you any alarm; it is merely nature's way of disposing of superfluous blood. Sixty or seventy years ago the doctor in attendance on your daughter's case would have accomplished this with the aid of a lancet; I leave nature to do its work.

At the same time, I desire to draw your attention to my "Hæmofactor" or blood-maker. I enclose a descriptive pamphlet, and you will notice that it promotes the secretion of new, rich blood, by passing a gentle electric current through the heart, liver, kidneys, and lungs. It is worn under the clothing, and does its work day and night. It occasions no pain, other than a slight tingling at the first contact of the electrodes with the flesh, and it generates enough electricity to run two 64-candle-power incandescent lights. I make a special discount on this apparatus to the clergy, which reduces the cost to \$50, expressage paid. May I send you one? With regard to the night-sweats, double the dose of vitaline and give six instead of four capsules of bovisang per day.

Anticipating that you will follow these directions, I have doubled the quantity of these medicines. You can remit the additional cost (\$7.50) when you next write me.

Yours for health,
ANDREW A. SCOOPER, M.D.

(11) ST. JOHN'S RECTORY, MORRHUOPOLIS.

DEAR DOCTOR SCOOPER:—In reply to your kind letter, I am glad to say that I am improving every day; I still feel somewhat weak, and last week I lost a little blood, but I feel confident that when the warm weather comes again I shall be perfectly cured. I am wearing the hæmofactor all the time, and every day I take ten capsules of the bovisang. Mother wishes you to send on two bottles of vitaline and four boxes of the capsules. I enclose postal order for the amount. I am sending my photograph as requested; it was taken over a year ago. With many thanks for the good you have done me,

Yours very sincerely,
MARY LEE.

(12) ST. JOHN'S RECTORY, MORRHUOPOLIS.

MY DEAR ALFRED:—I write to inform you that our dear Mary passed away yesterday. I am thankful to say that the end was swift, and she was spared much suffering. I induced her to see Dr. Saunders about a month ago, and he told me there was absolutely no hope. He advised me to humor her in any way I could, and I obeyed his instructions. Until the time of her death she firmly believed she was on the road to complete recovery. She even wrote that fellow—Scooper, in Chicago—that she was almost cured. He must have received her letter within a day or two of her death. You know how averse I was to removing her from the sanatorium, but it was impossible for me to withstand the united appeal of herself and my wife.

We have paid this Dr. Scooper about \$300 for his medicine and treatment. I would have gladly paid ten times the sum if it had done her any good. I am firmly convinced that, had she seen fit to follow your instructions and complete her course at the sanatorium, she would have been alive at the present day.

Again thanking you for your kindness to my poor girl,

Your very sincere friend,
JOHN LEE.

(13) CHICAGO.

DEAR MADAM:—I very much regret to hear of the death of your daughter, more especially as she wrote me a most bright and cheerful note only a few days ago. While I meet with an occasional case I am unable to cure, it is almost invariably one where someone else has attended it in its early stages.

I note your remarks about the medicine which arrived too late to be of service to you, and I would gladly take it back and refund you the money, but to do so would be a breach of my business regulations. I would recommend you to keep it by you, and when any of your friends are threatened with lung trouble you can, no doubt, dispose of it to them. Yours for health,

ANDREW A. SCOOPER, M.D.

(Clipped from the *Skowhegan Democrat*, three years later.)

"The portrait printed above is that of Miss Mary Lee, the only daughter of a prominent doctor of divinity; she narrates below the great benefit she derived from the celebrated Doctor Scooper's treatment." Here follows letter No. 11, and half a column of advertising, disguised as reading matter.

(From the same issue of the *Democrat*.)

"The colored boy, Bill Harris, who was remanded by Judge Mill, yesterday, on a charge of obtaining fifty cents under false pretenses was brought up for sentence this morning. His Honor said that as it was a first offense, he would be lenient, and sentenced him to six weeks in jail, with hard labor."

ORIGINAL ARTICLES

SHOULD THE YOUTH OF THIS COUNTRY BE INSTRUCTED IN A KNOWLEDGE OF SEXUAL PHYSIOLOGY AND HYGIENE?

BY

PRINCE A. MORROW, M.D.,
of New York City.

Universal elementary instruction has come to be accepted as the most valuable of all means for the prevention of communicable diseases. Its importance is emphasized in the case of diseases, the communication of which lies entirely within the control of the individual.

Since the special class of diseases, which it is the object of this society to prevent, have their almost exclusive origin in the irregular exercise of the sex function, it would seem logical to conclude that a knowledge of the physiology and hygiene of this function would constitute a valuable prophylactic measure.

The question assigned me in this discussion is, Shall the youth of this country receive this instruction? In the necessarily brief limits of this paper, I shall consider it chiefly from the standpoint of its practical utility.

In his exhaustive treatise on "Adolescence," W. Stanley Hall, president of Clark University, declares that the physiology of sex "is the largest and most complex, the most important and interesting of all human themes." Further, that "this age and theme is the supreme opening for the highest pedagogy to do its best and most transforming work," etc.

The education contemplated in our program is, however, comparatively restricted in its scope. It is simply to give to the youth of this country a clear comprehension of certain physiologic truths which have a direct bearing upon the regulation of their sexual lives and of the serious consequences, in the shape of disease and death, which follow a breach of hygienic laws. In other words, it is to teach them how to live according to the laws of a healthy nature. It is obvious, however, that they cannot be expected to so live unless they know what those laws are.

Herbert Spencer, in his masterly essay on "Education," defines what knowledge is of most worth in the order of its importance as follows: Of primary importance is that knowledge relating to self-preservation, or which ministers directly or indirectly to the maintenance of life. Next in importance is that knowledge relating to self-perpetuation or parentage, which prepares for the creation and rearing of offspring. Of subordinate importance is the knowledge which prepares for the maintenance of proper social and political relations, as well as the gratification of the tastes and feelings. "Strangely enough," he says, "the most glaring defect in our programs of education is entirely overlooked. To prepare the young for the duties of life, is admitted by all to be the end which parents and schoolmasters should have in view. Though some care is taken to fit the youth of both sexes for society and citizenship, no care whatever is taken to fit them for the still more important position they will have to fill—the position of parents."

The education proposed by this society has a three-fold application. It ministers: 1. To self-preservation, in the prevention of diseases which may seriously compromise the health or life of the individual. 2. To self-perpetuation, as it specifically relates to the preservation of the integrity of the function through which life is perpetuated. 3. To the social organization, as it is only by keeping the springs of heredity pure and uncontaminated that the future fathers and mothers can discharge their highest duty to the State in the production of healthy and capable descendants.

Since health is the essential condition of the fullest and most complete living, every one, perhaps, would endorse the abstract proposition that a knowledge of the functions of the human body and of those physiologic laws, which have a direct bearing upon the preservation of health, is of superior importance, and should form part of a rational education, but insofar as this knowledge relates to the laws of life and reproduction, it is not recognized as a desideratum. On the contrary, it is condemned, both by sentiment and established routine, as unfit and improper.

The maxim, "Know Thyself," is regarded as the concrete expression of the highest wisdom, but our educational policy is entirely to ignore sex—that most important part of self—as if it were practically nonexistent, and yet we must recognize that the development of the sex function is intimately associated with the physical, mental, and moral growth; it profoundly modifies the intelligence, habits, and character; it is bound to be a factor, and a most important factor, in the future life and conduct of the individual. It is practically certain that this function will be exercised normally or abnormally, legitimately or illegitimately, by 9 out of 10 of the rising generation, and with results beneficial or harmful—it may be disastrous to themselves and to others. Experience shows that thousands suffer physical and moral wreckage from trusting to blind instinct as the sole and sufficient guide for its regulation.

It would seem to be the aim of most parents to launch their children into the world in a state of Edenic innocence, and there is nothing more fatuous than their illusion that they succeed.

The principal of a large preparatory school in this city said to me the other day: "This morning a gentleman entered his son, a well-grown lad of 17, in my school. He was most particular in his inquiries whether there were any bad boys in the school. 'My son,' he said, 'is as innocent as a babe, and his mother and I wish to keep him so.'" This is the ideal of many parents who confound innocence with ignorance. "The error is noble, the vanity fine," but it is not possible, even were it desirable, to preserve this state of infantile ignorance. It is natural that the youth should wish to know something of the origin of life—whence he came into the world, and how human beings are propagated. The "fable of the stork" scarcely survives the "myth of Santa Claus." In seeking this knowledge the youth is but obeying a law of his mental evolution.

The consciousness of sex is the first mark of adolescence. It is inconceivable that a sentient, intelligent being should be conscious of the stirrings of new sensa-

tions and impulses which center in the sex organs without wishing to know something of this physical endowment. The mind of youth is peculiarly avid of this knowledge, especially since the development of sex comes at a period when interest and curiosity are the dominant intellectual traits. The very mystery and concealment thrown around sex supply the strongest incentive to this curiosity, and since this knowledge cannot be had from legitimate sources—that is, from parents and instructors—it is gained surreptitiously, and usually from depraved sources—from dissolute companions or from erotic or quackish literature.

After all it is not a question whether the youth shall learn something of sex and self, rather it is a question whether it shall be scientific truth or dangerous error, whether this instruction shall be sound, sanative, wholesome, and moralizing in its influence, or whether it shall be false, unhygienic and demoralizing in its tendency.

Now as to its practical utility. One incidental, but most important benefit from the teaching of sexual physiology, if sufficiently timely, would be the prevention or correction of that physical sin known as self-abuse, the extensive prevalence of which among youth need only be mentioned. While the consequences of the unnatural exercise of the sex function forms no part of this society's study, I may be permitted to allude to it briefly, in passing, as it constitutes in my opinion an important etiologic factor in the initiation of sexual debauch. I am aware that it is popularly supposed that self-abuse and sexual intercourse are antagonistic—by many, the one is regarded as the necessary alternative of the other. So far from being a protective the former is a most powerful provocative of the latter. According to my observation it is not the strongly sexed, the most virile young men who are most given to licentiousness, but those whose organs have been rendered weak and irritable from this unnatural exercise—in whom the habit of sensual indulgence has been set up and in whom self-control has not been developed by exercise. These sexual weaklings yield to sensual impulses which the normally strong feel, but repress. Many a young man enmeshed in the toils of this solitary habit seeks in licentious intercourse an escape; too often physicians recommend the latter as a means of cure. This practice is mentioned only to be condemned. "Get a woman" as a therapeutic formula, is as unhygienic as it is immoral.

Perhaps the strongest argument for instruction in sexual physiology is that it would correct the conventional view, based upon a perversion of physiologic truth, that incontinence in men is a necessary condition of health. Sound physiologic teaching would demolish this stronghold of masculine licentiousness—the so-called "sexual necessity"—behind which is entrenched the double standard of morality. Physiology gives the lie to the "wild oats" fiction; it refutes that wretched sophistry which would strip masculine immorality of its guilt and make of it a pardonable pastime—even a hygienic procedure. Physiology clearly teaches what is confirmed by experience, that continence is compatible with the highest physical and mental vigor. As Sir James Paget has said, no man was ever the better for incontinence or

the worse for continence. Licentiousness finds no justification or shadow of support in the teachings of sexual physiology and hygiene.

So much for the constructive phase of this education, which aims to build up what may be termed the "sexual character" of the individual upon the foundations of sound knowledge, self-reverence, respect for women and for good morals.

There is, however, another phase of this hygienic education which has perhaps a more important bearing upon the specific object of this society's work—the prevention of venereal diseases.

It is generally recognized that these diseases have their chief source in that irregular commerce between the sexes known as prostitution, and that exposure and the contraction of disease are almost inseparable. It is the province of hygiene to warn against the exercise of any function of the body under conditions which cause disease, and in order that this warning may prove effective as a restraint, it is necessary that those who expose themselves should know to *what* they expose themselves. An adequate conception of the real significance and veritable danger of these infections forms, then, an essential part of this hygienic education.

Many parents who might look with favor upon instruction in sexual physiology, would draw the line at the mention of sexual disease. Such education, it is alleged, would open up a horizon of shameful and repulsive morbidity which had best be hidden. From the scientific standpoint, these infections are merely matters of microbic invasion, and the shame, if there be any, attaches to the act of exposure and not to its pathologic consequence. But, after all, the young are not so ignorant of the existence of the diseases incident to vice as their elders pretend to believe. Many of them have a theoretic, and some of them, unfortunately, a practical knowledge while yet in their early teens.

Fournier's statistics show that of every 100 syphilitic infections among the educated, well-to-do classes, no fewer than eight occur from the fourteenth to the nineteenth year; in the working classes this proportion rises to 13%. Of every 100 cases of gonococcus infection, 12 occurred from the thirteenth to the nineteenth year. So that it may be accepted as a low conservative estimate that 10% of all venereal infections occur before the nineteenth year, or during the scholastic age. From the nineteenth to the twenty-third year there is a rapidly ascending scale of frequency. Youth and early manhood represent, then, the period of greatest sexual vulnerability.

There is no reason to believe that the precocity of vice is less marked in this country than in France. Physicians can testify to the great frequency of juvenile contaminations in this city and what has been termed "the amazing and unparalleled existence of vice" in student life has been recently publicly commented upon by teachers in colleges and universities.

While it is difficult to formulate the precise period at which this pathologic lesson should be given, it is hardly probable that it will be premature. It has been claimed that up to the age of 14, the youth should be protected against himself, after that against outside temptations.

The objection that this early education would precipitate the evil we wish to prevent is hardly worth refuting. No young man was ever led into licentiousness by reading a serious book upon its dangers. It would be just as insensate to claim that he would be tempted to drink more freely from an infected water-supply when told that it contained germs of typhoid.

The importance of this prophylactic education to the rising generation is enhanced by the fact that the incidence of these diseases falls most heavily in early manhood, at or before the marriageable age. These infections are not limited to those who contract them in licentious relations, but they are introduced into legitimate unions, they condemn thousands of innocent wives to sterility, to lifelong invalidism, or mutilation to save their lives; they are transmitted in full virulence to their offspring, peopling our asylums with the blind, the idiot, the feeble-minded and physical degenerates, they thus constitute a social peril of the greatest magnitude.

From this incomplete survey of the subject it would appear that the education contemplated in our program is designed to have an important influence not only upon the individual life, but upon the social organization. It may be fairly claimed that education in sexual physiology and hygiene conduces to health and physical morality by inculcating the ideal of a clean mind in a sound body, and by teaching that the reproductive function is given for a higher purpose than mere sensual gratification—that it should be restrained by reason, regulated by self-control, and exercised in the legitimate way imposed by marriage. I hold it to be a cardinal sin against youth to deny them that knowledge which would safeguard them against ignorant exposure to dangerous infections, the existence of which many of them do not realize and the significance of which none of them fully comprehends.

This education, to be salutary as a safeguard, should be given in youth, for it is at this period that the foundations of the sexual character are laid and habits of mind and practices are formed, which, in a great measure, determine the future sexual life of the individual.

THE MEDICAL TREATMENT OF ABDOMINAL PAIN NOT OF GASTRIC ORIGIN.¹

BY

JAMES E. TALLEY, M.D.,
of Philadelphia.

Since pain in the abdomen is usually but the surface indication of various pathologic conditions that exist in the different underlying organs, nowhere than here is it more true that he who diagnoses well cures well. Perhaps nowhere else is an absolutely accurate differential diagnosis more difficult than in the upper quadrants of the abdomen, the lower having the advantage of the vaginal and rectal exploratory routes. A careful diagnosis being presupposed, we pass to the treatment, drawing largely for our classification of the causes of abdominal pain upon the article of Musser in the "Transactions of the Medical Society of the State of New York, 1904."

¹ Prepared for the West Philadelphia Branch of the County Medical Society, February 11, 1905.

I. *Hernias*.—Hernias of the linea alba (epigastric), the linea semilunaris, as well as small hernias of the ordinary varieties, are frequently the cause of abdominal pain. The relatively large number of epigastric hernias seen in the various gastrointestinal clinics on the continent, is due perhaps less to racial peculiarities than to the fact that there are collected in larger numbers all sorts of the various ptoses with the concomitant relaxation of the abdominal walls which favor hernial development.

In this connection may be mentioned also the article by Stockton,¹ "Abdominal Pain from Unsuspected Irritation at the Internal Hernial Ring." In dispensary practice I have seen two cases of the latter, one in a horseshoer, and one in a man who used all day long a foot-lathe; both of these were relieved by properly fitting trusses. In this class of cases, as well as in painful hernia of the ordinary varieties, a truss is usually sufficient. A large proportion of the epigastric hernias gives no inconvenience, but when they are the source of distress a truss or a pad with adhesive plaster may be tried. However, according to von Bergmann, operation offers the only sure method of relief and cure.

II. *Functional Neuroses*.—We all agree with Musser that the more accurate our diagnoses, the less abdominal pain due to hysteria we shall see. One needs to keep constantly in mind that neurotic patients are no less subject to genuine morbid processes than others, and we should not let the too evident neurosis blind us to the anatomic changes that can be found by care and patience.

A nervous young woman accustomed to appear on the public platform was for years frequently incapacitated by severe attacks of epigastric pain brought on by the excitement attending her work. The neurosis was the most evident thing, the attacks not characteristic; she had gone through a rest cure, a course of tamponage and electricity, lavage and dieting, and yet grew more nervous and lost weight until finally an attack seemed to point more toward gallstones. An exploratory operation was done, some half dozen large gallstones removed, and now after some two or three years of freedom from attacks she has gained wonderfully in weight and is perfectly well.

A girl of 13 whose own mentality as well as that of her family was such as to be utterly useless in giving an account of her troubles, kept the whole family up several nights crying out that she had a clutching in her left side at the edge of the ribs "which choked off her wind." Repeated examinations on successive days revealed no tenderness, nor any trouble. Finally she was admitted to the hospital for observation, and during several days' stay she had several hysteria-like crying spells, but that was all. A few days after discharge she returned with a copious eruption of herpes zoster, after which she had no more attacks.

The treatment suggests itself when once the diagnosis is made.

III. *Intoxications*.—Musser has called attention to abdominal pain as a precursor of uremia, the treatment of which is, of course, the treatment for the uremia.

In lead intoxication the occupation and the blue line on the gums are the special diagnostic points. In lead colic, magnesium sulfate and sodium sulfate serve the twofold purpose of opening the bowels and acting as an antidote. The spasms of the intestine may be relieved

¹ *American Medicine*, June, 1904.

by large hot enemas, by atropin hypodermically, and perhaps eserine also a little later to promote peristalsis. Usually the pain is so intense in well-developed cases that morphin hypodermically is a necessity, though, of course, the less we use, the less it will interfere with the desired activity of the bowels. The after-treatment consists in the prevention of further ingestion of lead and promotion of its elimination by potassium iodid and pilocarpin internally and potassium sulfid baths.

Under this head may be mentioned a rather unique case seen some dozen years ago.

A masseur at the Orthopedic Hospital was seized with pain in the right iliac fossa; aside from this a temperature of 100° and urine loaded with urates and uric acid crystals were the only symptoms. The diagnosis appeared to lie between catarrhal appendicitis and gravel, without being distinctive of either. The resident was asked to count the leukocytes and he found plasmodiums in abundance. The exhibition of quinin was followed by relief and though I have seen him occasionally during the intervening years, he has never had any recurrence of symptoms pointing to appendicitis or gravel.

A sufficient explanation of the connection between the malarial infection and the iliac pain does not occur to me.

IV. Abdominal Pain Not Due to Disease below the Diaphragm.—He who examines his patients systematically is unlikely to take the crisis of locomotor ataxia for genuine abdominal lesions, and yet Billings mentions cases that were referred to him for supposed gastric disease. Last year I saw a man of 48, who had only Argyll-Robertson pupils and severe attacks of epigastric pain. The possibility of there being gastric crises was finally set aside by a characteristic attack of gallstone colic followed by a moderate icterus.

Not infrequently the first symptom of thoracic aneurysm is intercostal neuralgia which may radiate to the abdomen.

As to diaphragmatic pleurisy, I have seen an elderly woman succumb, absolutely worn out by the pain, in spite of the united resources of three consultants of note.

Though abdominal pain is more common in the pneumonias of children, adults are not exempt. A central pneumonia in a woman of 40, with intense pain in the right iliac fossa, and vomiting, kept her attendants on the anxious bench for two days before a diagnosis could be made without reserve.

A case of persistent pain under the left edge of the ribs was explained only when the to-and-fro friction rub of chronic pleurisy near the left base was discovered.

V. Hepatic.—The possible hepatic conditions are perihepatitis, gallstones, cholecystitis, and cholangitis. Of these, cholelithiasis, with or without cholecystitis, holds first place as a cause of acute abdominal pain.

Biliary Colic.—A few whiffs of chloroform will ease the excruciating pain until the hypodermic of morphin has had time to act. The pain is usually so severe as to require morphin, and physiologically, atropin sulfate and nitroglycerin should add to the effect of the morphin. Drinking hot water, the local application of large hot compresses over the liver region, and perhaps the full hot bath may all be helpful. If the stomach is

retentive, the saline cholagoges should be given to unload the bowels and for the depleting effect.

Treatment between the Attacks.—The indications for the radical surgical treatment Dr. Deaver will cover. The next 20 years will do much both within and without the profession toward a better understanding of the necessity for early radical treatment. For the present there remains for the internist, patients who have had but one or two mild attacks and by far a too large percentage who have had severe attacks and yet refuse operation, so long as there are no secondary complications. Also, in our lists of gallstone cases we all have some patients who have reached their threescore years or threescore and ten, the condition of whose kidneys and hearts, in the absence of impelling indications for operation, make us wary of insistence. For all these there are at least palliative if not curative resources. That any known medicinal agent can dissolve actually existing gallstones in the gallbladder is a fallacy. Brockbank has proved that the saline laxatives (cholagoges) have no such effect. He allowed gallstones to remain for two weeks in 10% solutions of the following sodium salts: Salicylate, sulfate, benzoate, phosphate, bicarbonate, chlorid, as well as potassium sulfate and ammonium chlorid, and at the end of that time the stones showed no loss in weight.

The experiments with olive oil, oleic acid, and animal soaps in the laboratory are more satisfactory, as they cause the stones to soften and disintegrate. But gallstones in the laboratory and in the gallbladder are under different circumstances. There is no evidence to prove that even when given in large amounts, enough oil or its fatty acids or soaps is absorbed to have any solvent effect on the existing gallstones. However, since the products of digested fat do occur in the bile and dissolve cholesterin, there is a possibility that the giving of olive oil may help prevent the formation of more stones, and it is still given by some in amounts of 2 oz. to 10 oz. daily by mouth or rectum.

Though the salines do not actually dissolve gallstones, the experiences at Carlsbad alone prove that the waters have a very decided and beneficial effect. Their action probably depends upon the fact that they render the bile more fluid and thus prevent further formation of stones, cleanse the gastric, duodenal, and perhaps even the biliary mucous membrane, and increase peristalsis, which not only keeps the bowels free, but depletes any existing irritation or inflammation within or without the gallbladder. No one claims any longer that the Carlsbad water has any specific action, so the patient will probably do as well if he drinks freely every morning of our own Saratoga or Carlsbad, or the Bedford magnesia water, or even large quantities of plain hot water containing 1 dr. or 2 dr. of sodium phosphate or sodium sulfate or magnesium sulfate.

Of all the drugs suggested, perhaps sodium salicylate and sodium benzoate, because they are bile stimulants, are at least as useful as any. They may be given, according to Chauffard's¹ suggestion, 1 gm. to 2 gm. (15 gr. to 30 gr.) of each, daily for 10 to 20 days each

¹ Progressive Medicine, December, 1903.

month and continue for months. In this connection may be mentioned that Kuhn (quoted by Steele¹) has found salicylic acid and sodium salicylate the most efficient biliary antiseptics. They are freely secreted in the bile and his experiments have shown that they have a very decided germicidal action in very small percentages.

Though ether, chloroform, turpentine, and a host of other remedies have been used and find their champions, they are, to say the least, not superior to the salicylates.

Hygiene.—Since women furnish the larger percentage of gallstone patients, attention to lacing is important. The general stasis produced by the constriction of corsets affects not only the circulation but also the flow of bile itself, a fact which every autopsy room sees proved by the actual indentations and malformations of many female livers. Want of sufficient exercise with its attending constipation is an element not to be overlooked.

Diet.—Excessive use of meats and starches and alcohol must be forbidden. Sufficient albuminous food must be taken, as the metabolism of albumin furnishes the sodium glycocholate and taurocholate of the bile, which are the solvents of the cholesterin. Insufficiency of these bile salts allows precipitation of cholesterin and gallstone formation. Butter and other animal fats are allowable, since fats seem to have some favorable effects.

V. Renal Pain: Nephrolithiasis: Floating Kidney: Intermittent Hydronephrosis: Pyelitis.

Nephrolithiasis.—The treatment naturally falls under two heads—that of the renal colic and of the condition during the intervals. The relaxation sought in renal colic may be procured by a hot bath, by hot local applications (poultices or stupes), by inversion or other change in position, by chloroform, and finally by morphin, with atropin or nitroglycerin. The pain is often so intense and persistent that more than one hypodermic may be necessary to secure relief.

The treatment during the interval consists in attention to quiet living, to avoiding sudden and heavy exertion, and yet taking enough gentle exercise to promote digestion and elimination, especially if the occupation is sedentary. The diet should be antilithemic. Especially should wines and malt liquors be banished. But if the patient must have alcohol, good whisky, well diluted, should be allowed.

If the urine is very acid, the patient should drink large quantities of pure water, as Poland, containing potassium bicarbonate or potassium citrate, in 1 gm. to 1.3 gm. (15 gr. to 20 gr.) doses three or four times a day, or, if preferred, genuine lithia or vichy celestin. The continuation of these potassium salts in 2 gm. to 4 gm. ($\frac{1}{4}$ dr. to 1 dr.) doses three or four times a day, is known as Roberts' solvent treatment (of stone), but that it can have any genuine solvent action, appears rather unlikely. The same may be said of piperazin in the ordinary doses given, and yet it serves so well to clear the continuous lateritious deposit from the urine of gouty individuals that one feels loath to award it no place.

If the urine is alkaline, lithia and vichy are contra-

indicated, but plenty of pure water with urotropin, formin, elixir of uritone or sodium benzoate or ammonia will render the urine acid and keep it aseptic.

Among the resorts patronized in this country by such patients are Saratoga, Bedford, Poland, and Cambridge Springs.

If the pain is continuous or attacks repeated at very short intervals or there is any evidence of actual stone as shown by the skiagrams, or the urine shows signs of pelvic and perhaps even renal irritation, then the case becomes a surgical one.

Movable Kidney.—The acute pain of this condition is the so-called Dietl's crisis, and the use of narcotics is necessary to procure relief. The chronic dragging distress of a prolapsed kidney needs first of all the wearing of a properly fitted bandage preferably adjusted while the patient is in the recumbent position. That the addition of pads for either a ptosis of kidney or stomach affords any advantages I have not seen. If the patient is thin a course of treatment to increase the weight is to be considered, and tight lacing and severe exercise are to be tabooed.

It strikes me as most excellent advice, if we discover a well-marked movable kidney and it is giving no particular distress, to refrain from directing the patient's attention to the abnormality. At least two neurotic women would have had one less trouble to mend had not a painstaking masseuse drawn their attention to their displaced kidneys.

Intermittent Hydronephrosis.—This trouble, though rare, if diagnosed, may need no treatment if mild. Perhaps a bandage may be necessary and if the tumor is large it becomes a surgical condition, as puncture alone relieves.

Intestinal.—The sources of abdominal pain in the intestinal tract are almost innumerable. Strangulation, intussusception, volvulus, enteritis, whether of the acute, chronic or mucous variety, acute hemorrhage or perforation of ulcer, perversion of intestinal digestion and many other conditions may cause abdominal pain, but it is impossible to consider them in the time allotted me, and frequently the pain here is but part of a well-developed disease or condition the name of which carries the suggestion as to its treatment.

The more recently discussed abdominal pain due to the mesenteric vessels sharing in the general atheroma should not be overlooked. The persistent use of vasodilators seemed to give relief in a recent case.

Appendicitis is comparatively so frequent and of such importance that it merits more careful consideration.

Appendicitis.—Though the discussions of the treatment of appendicitis are numerous, the general conclusions that a large percentage of the profession subscribe to are really few. That there is no specific medical treatment, that the condition is surgical, and that the surgeon should be called as soon as the diagnosis is suspected, few will gainsay. I have never seen nor heard of a patient operated on too soon. The diagnosis once reasonably sure, but few of us have missed at some time in our careers the heartache due to waiting for the interval that never came.

However, between the diagnosis and the operation,

¹ Progressive Medicine, December, 1904.

or if permission is refused, or if there are contraindications, there are certain well-defined things to do for the patient.

Absolute rest in bed in the dorsal position with enforced use of urine and bed pan are necessary. The withdrawal of all food and practically all liquid for 12 to 24 hours prevents peristalsis and gives less material to ooze into the peritoneum in case the appendix does perforate. For thirst teaspoonful amounts of liquid or very small hot enemas will answer; large enemas are likely to promote peristalsis. For repeated vomiting, especially if there seems to be retained food, lavage has been advised.

For the pain itself the use of the ice-bag is universal. It should be in place continually, with a layer of flannel or lint between it and the skin. Its size should be ample and the ice kept well replenished. If too heavy for the tender area a means of partial suspension must be devised. The Leiter coil is an alternative if the weight of the bag is really unbearable. A solution of menthol in alcohol has also been recommended. When children and nervous individuals complain bitterly of the cold, we can find good authority for the use of hot applications.

As in a large proportion of cases these local applications fail to give the desired relief, the opium question arises. As very frequently the surgeon sees the patient once or perhaps twice between the suspicion of diagnosis and its final confirmation, the family practitioner has often to thresh out the subject with the patient and family, both of whom are beseeching relief, the one because of physical distress, the other from distress of mind due to the cries of the sufferer. In this emergency, patience, good judgment, and skill in handling people as well as drugs are requisite. The diagnosis once reasonably sure, the better alternative is to hurry up the time of operation, but when this is impossible and the patient's lamentations are distressing to all concerned, the most decided opponents of the use of opium are not always entirely consistent in their writings and their actual practice. In such cases a single small dose of morphin by hypodermic if necessary, judiciously repeated once, gives the greatest relief and is harmless if the amount given is just enough to quiet the patient without affecting markedly the sensorium, the pupils, the amount of urine, and peristalsis. But comfort should not be purchased by an amount that obscures the symptoms, especially when the diagnosis is uncertain.

On the question of purgatives the opinion seems more uniform. The salines are relegated to the past as likely to be distinctly harmful by promoting peristalsis and possible perforation. Very early in the attack when there is a distinct history of the patient's having eaten indigestible food, divided doses of calomel are permissible, but not salines even here.

Pancreas.—For acute pancreatic diseases causing abdominal pain there is no medical treatment. If they are diagnosed or suspected they should be watched with the surgeon from the start.

Spleen.—That the spleen is not more often the seat of well-defined abdominal pain is remarkable when we consider how very frequently in postmortem examinations a perisplenitis is found. Infarcts are common and

thrombosis and embolism of its vessels also occur. A case of splenic abscess reported by Gravit simulated typhoid. These facts are, however, more important to the diagnostician than the therapist.

Peritonitis.—For the pain of general peritonitis have been used locally mustard plasters, hot stupes, ice-water stupes, ice-bags, Leiter coils, and in strong individuals leeches. An amount of morphin hypodermically that gives a fair degree of comfort is indicated. To secure this, these patients require larger doses, but not the heroic doses of old.

Purgatives are out of the question as long as there is the suspicion that the peritonitis arose from a perforated ulcer or appendix. A single enema to unload the bowels is permissible and small enemas containing suds and turpentine may be necessary to relieve the tympany.

Pelvic.—Patients with salpingitis, ovaritis, metritis, and pelvic peritonitis need relief for the pain. Here large ice-bags or more usually large hot sand-bags are useful. Large hot douches add to the comfort as well as combat the inflammatory process. The depletion by not too drastic purgatives is beneficial. The promotion of peristalsis by eserine is desirable to prevent tympany, and an amount of morphin to secure quiescence alone demanded.

Ectopic pregnancy must always be borne in mind as a possible cause of sudden abdominal pain.

A CASE OF CEREBELLAR TUMOR.¹

BY

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Before presenting this communication upon a rather unusual case of cerebellar tumor, I wish to state that the man in question was sent to me for ocular treatment by Dr. A. T. McMullin, of Kensington; and I wish also to thank Dr. William Turner VanPelt for his care of the patient at the Episcopal Hospital during the last stages of his illness, and for his extreme courtesy in giving me the later history, which thus enables me to present the case in full.

The patient, a young man of 26, the fourth of eight children, had come from England in boyhood. He was a printer of cotton stuffs. He had passed through infancy and adolescence without serious illness. At about 15 he had an attack of insolation, from which he promptly recovered without sequels. His father died of heat stroke four years ago; recently a paternal uncle died of apoplexy. There is no history of tuberculosis or of cancer in the family.

At Easter, 1904, the young man was suddenly seized with a violent attack of headache, which lasted four days. There were no unusual symptoms associated; it caused no alarm, and good health was regained. In July he was married and sailed for England. In mid-ocean he felt very heavy-headed, so he remained in his berth until noon each day for the rest of the voyage. Once he was seized with violent vomiting. These symptoms were thought by the ship's surgeon to be only those of seasickness. After landing, and on arrival in

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London, he had severe headaches, and, without previous dyspeptic symptoms, violent attacks of vomiting, which were projectile in character. Then for a considerable period thereafter, until about September, he had headaches on alternate days, the attacks usually taking place on awaking in the morning. He was not affected by sightseeing tours. After September, until sailing for home in October, there were infrequent attacks. On the voyage he was very sick, having but two well days; on three of the days there were violent spells of vomiting. On landing, October 20, he vomited from 2 o'clock a.m. until 8 o'clock a.m.

It was at this time that his physician, Dr. McMullin, was sent for. The young man was suffering intensely from pains in the head, in the occipital and frontal regions. These pains were usually most violent early in the day, subsiding at evening. All of the bodily functions at this time were apparently normal, but later, about the middle of November, the right side of the face became crooked, which continued for about a week. The tongue was not affected. Now, for the first time, it was noticed that the external rectus muscle of the left eye was paralyzed, and a day or so later diplopia, which was said to have been alternating in character, set in. This was followed by dimness of vision, and photophobia. Except on the days of the headaches, when the arms and legs felt numb, he was able to exercise and to take long walks without fatigue. The headaches had gradually subsided, and a loss in bodily weight was rapidly regained. At no time had his friends noticed alteration in his gait or carriage. He felt well and reasonably happy. At times, when he had his headaches, he became irritable when the younger members of his household were noisy. This is not to be wondered at, when we consider the fact that all of the family were members of an amateur orchestra. He had led a most pure life, and by his statement, he was free from venereal disease, yet he was greatly annoyed by a painful priapism, which impelled him into inordinate sexual indulgence without gratification.

The man was sent to me on December 22, 1904. He was five feet seven inches in height, robust, weighing about 145 pounds, having a good, ruddy complexion. There was nothing remarkable in his gait or station. His movements about the darkened room were in the manner of one whose visual fields had been contracted. His expression was vacant, like the state of one having optic neuritis. The tendon reflexes were apparently undisturbed; neither were disturbances of general sensation complained of; while objects and familiar utensils were handled with accustomed facility. His replies to my inquiries were clearly and concisely given, his memory being perfect and retentive.

The chief complaints at this time were referred to the ocular apparatus. The visual acuity of the right eye was reduced to 6/15, of the left to 6/22.5; the accommodation power was abolished, so that Snellen's reading types could not be read. The optic axes markedly converged; the left external rectus muscle failed to effect parallelism. There was no nystagmus. Homonymous diplopia was complained of, but it was not possible to measure it satisfactorily. Except in outward rotation, the muscular movements of the left eye were unlimited. The pupils measured 4 mm. each, and were fixed, failing to respond to the usual stimuli; but when, however, the eyelids were forcibly closed, and after pressure on the frontales muscles, the eyes suddenly exposed to strong light, the pupils dilated widely. This paradoxical pupillary phenomenon was constantly obtained after repeated experiments. When the facial muscles were at rest the normal relations of the two sides of the face were disturbed (the left side was slightly drawn over to the right); when efforts were concentrated, the relationship between the two sides became readjusted. The protruded tongue could be directed forward, though it was very tremulous. The visual fields were concentrically

contracted; colors were not perceived and the blind spots were greatly enlarged. There was no history of polyuria; neither was albumin nor sugar detected.

Ophthalmoscopic Examination.—The right pupil was not perfectly round, nor was there a reflex during the examination with the mirror. Fine granular deposits, resembling those of ciliary exudation, were noticed on the anterior capsule. There were no signs of antecedent iritis. Projecting into the clear vitreous was a greatly swollen optic nerve head, the summit of which was measured by a plus 5 D lens. The retina was everywhere edematous, the macular and foveal region remaining like a deep pit surrounded by the raised retinal sheet. No areas of exudation were discovered. The arteries were constricted and reduced to threads, while the veins were great, broad, tortuous currents. On the swollen nerve head were several flame-shaped hemorrhagic extravasations. The fundus conditions of the left eye were quite similar to those noted in the right, though they were more extensive and pronounced. The hemorrhagic extravasations on the disc, as well as those in the fiber layer of the retina, were larger and more



numerous. These extravasations were like those seen in marked cases of hemorrhagic retinitis and other ocular diseases, and have frequently been noted in cases of cerebellar tumor. The intraocular symptom-complex differed, however, from that observed in the course of systemic disease. In the walls of the bloodvessels no signs of degeneration were apparent; the entrance and exit of the currents were mechanically interfered with by the choked disc.

In reviewing the history of the case, the points to be observed are: 1. Head pains localized at the occiput, though at times radiating to the vertex. 2. Vomiting, without nausea, nor dependent upon the ingestion of food; indeed, it invariably occurred in the morning. 3. The early development of an intense optic neuritis, the effects of which were relatively equal in the two eyes. With these symptoms, so marked from the beginning, I was safe in assuming the case to be one of brain tumor. Of some special or localizing symptom, however, I was in doubt. There was the facial palsy, yet this had not remained constant in extent and duration. The pupillary reaction was paradoxical. 4. There remained to be considered only the abducens palsy. I could not help regarding this as of importance

in connection with the other factors, and particularly the optic neuritis, in spite of the uncertainty of the causation of this symptom. There is no cranial nerve so liable to provide a distant symptom as the sixth. The lengthened course which this nerve takes over the most prominent part of the pons renders it readily affected by distant pressure. (Gowers, quoted by Swanzy.) I was fascinated by the presence of this symptom, and I boldly ventured the diagnosis of cerebellar tumor.

On December 27, the patient was admitted to the Germantown Hospital. Here he was confined to bed and a course of treatment was instituted, consisting of alteratives, diaphoretics, and salines. At the end of ten days the convergence and the diplopia had disappeared. The edema of the retina and venous engorgement became remarkably reduced, and no new hemorrhages were noted. The patient was then allowed to be out of bed, and was given the freedom of the ward. At no time was there vomiting or headaches, neither was there disturbance of locomotion nor change in station—of this there can be no doubt. The visual acuity of each eye remained unchanged. The optic papillas remained as prominent as at the earlier examinations. During the patient's stay in the hospital I was not a little surprised at the speedy regression of the symptoms. It was impossible for me even to guess at the kind of tumor contained within the cranial cavity. It surely was not an abscess; there had been no rise of temperature, and abscess predisposes less to optic neuritis than tumor, and I was disinclined to believe it to be a gummatous tumor, and yet the prompt cessation of all the symptoms, even the retina was less edematous, which followed upon the thorough mercurialization, threw my thoughts into confusion. I felt justified, however, in allowing the man to return to his home.

On January 23, 1905, he was discharged from the hospital, and I saw him repeatedly at my office. On February 13, early in the morning, for the first time since December 20, 1904, there was an attack of vomiting, followed by much disturbance of the vision. At about 10 o'clock the man came alone to my office. The optic nerve heads were greatly swollen; the retina intensely edematous, while in the macular regions of each eye were large atrophic patches. On February 22, my notes record that he had indulged in walks of several miles without fatigue or disturbance of coordination. His wife had, in the meantime, begged me to forbid the taking of these long walks, because her husband usually had restless nights after such prolonged exercise. On this day, Washington's Birthday, he again came to my office alone; he very greatly enjoyed mingling with and watching the crowds surrounding the President, who was visiting the city. On February 26, he suffered from intense right-sided headaches, and Dr. McMullin was called. There had been short periods of semiconsciousness, and Cheyne-Stokes' respiration, with irregular pulse. Two days later I met Dr. McMullin in consultation, for on this day there had been tonic convulsive seizures involving the arms, with stiffness of the back of the neck, occipital pains and tenderness, and vomiting. At the hour I saw him, 9.30 p.m., he was absolutely free from all these symptoms; the pulse was slow and full; the grasp of the two hands strong and painful to me, and, except for the recollection of the frightful storm through which he had so recently passed, his cheerful disposition was unchanged. Neither fundus presented any new developments. I became all the more certain that there was a solid tumor at the base of the brain, located most probably in the cerebellar region. A return to hospital treatment was advised. On Thursday, March 2, he was admitted to the Episcopal Hospital.

On admission the man was found to be weak and debilitated, yet without actual loss of power in his extremities. His intelligence was good and his memory retentive. The examination of the blood showed the presence of 4,240,000 red blood cells; 9,400 white blood

cells, and 90% hemoglobin. Neither albumin nor sugar was found in the urine.

The vision of the right eye was 20/70, of the left 20/200. The outward rotation of the left eye was somewhat impaired owing to a paresis of the external rectus muscle. All movements of the right eye showed no impairment of the extraocular muscles. In neither eye were nystagmic movements observed at any time. The pupils reacted normally to light, convergence and consensually. The fields of vision remained contracted. The ophthalmoscopic examination showed great swelling of the retina, many splotches of degeneration, and small linear hemorrhages, and projection of the optic discs to 6D.

The cardinal symptoms complained of were headache, loss of vision, and nausea. There was spasticity of the muscles of the neck, with retraction of the head. No abnormal signs were obtained in the physical examination of the thorax, while the pulse and temperature were normal. The man was put to bed, mercurial inunctions daily were ordered; only a light diet was allowed. At once marked improvement in general health followed, and continued for 10 days. There were no attacks of vomiting, and but little nausea; he was greatly relieved of his headaches and expressed himself as feeling decidedly better. After two weeks the diet list was enlarged and potassium iodid in large increasing doses was prescribed. This lull was followed by a return of the storm in all its fury. The headaches were usually at the occiput; shooting pains starting from the left frontal region radiated to the parietal and the occipital. The head was retracted. Attacks of nausea and vomiting became frequent. The ocular conditions remained unchanged.

Shortly after admission, Drs. Davis, Stevens, and Ring examined the patient with Dr. Van Pelt, and concurred in the opinion that the case was one of brain tumor, yet they hesitated to decide upon the probable location of the tumor because of the unsteadiness of any localizing symptom.

On March 18, without loss of consciousness, there was a convulsion of the forearms, which lasted for several minutes; the hands became firmly clenched and flexed, while the forearms were flexed on the arms. Relief followed after inhalations of chloroform. As the attack passed off the patient vomited. A similar yet less violent attack followed on the next day, without vomiting, and three days later there was another seizure of shorter duration than the preceding ones. In this attack the patient was mildly rebuked by the nurse in charge, and requested to control himself. The convulsion immediately ceased, and no similar nervous phenomenon followed.

By this time the patient had become prostrated, the symptoms were greatly intensified, and the outlook more and more unfavorable. At night he was restless and delirious, while in the day he lay lethargic. On March 29, Dr. Wharton Sinkler was consulted. At this examination the patient could walk unattended, but in stepping forward he exhibited a distinct tendency to stagger and to fall towards the left side. The patellar reflexes were abolished. A diagnosis of cerebellar tumor was made with certainty, and the advisability of an operation to open the skull in the position best adapted for an exploration of the left cerebellar region was agreed upon. Consent for operation having been obtained from the patient's family, the man was transferred to the service of Dr. Neilson, the attending surgeon on duty, he having agreed to perform the operation.

Unfortunately the diagnosis was not confirmed in the operation-room, but at the necropsy, for, on April 7, the patient was seized with a violent delirium, from which he fell into a comatose state, and died suddenly four hours after.

Dr. Robertson, the pathologist of the hospital, was

allowed to remove the brain, and Dr. Spiller has very kindly examined it: The result of his study of the tumor and the regions affected by it together with remarks upon the clinical course of this very sad case, I am most fortunately able to have him present to you at the conclusion of this report.

It is interesting to speculate upon the probable result had operative procedures been instituted so soon as the abducens paralysis and the intraocular changes had become sufficiently pronounced to render the presumptive diagnosis of a cerebellar tumor positive.

In general, the symptoms were those of intracranial tumor of the hind-brain, rather than of the more forward portions. They appear to be those produced by irritation rather than by the destruction of the basilar centers. Although the intense papillitis was conclusive of the presence of a tumor, the indefiniteness of the other symptoms hindered the assumption that the tumor occupied the cerebellar region. The chief focal symptoms were those of deviation of the optic axes, with disturbances of direct and binocular vision, and facial palsy; yet, after energetic treatment the paresis of the left external rectus muscle, as well as the diplopia and the facial palsy, greatly disappeared, and when the man was placed under strict hospital regimen the general symptoms all but ceased, for there were no headaches, emesis, or muscular spasms, until the last course, after March 1. The gait, station, and the knee-jerks were not interfered with until very late in the progress of the malady. There was hyperexcitation of the sexual function almost until the end. The general bodily nutrition was maintained up to the last weeks of the man's life.

REPORT BY DR. SPILLER.

The tumor is situated upon the outer portion of the left lobe of the cerebellum, to which it is loosely attached. It is not at all infiltrating, but has made a depression in the left cerebellar lobe 2.5 cm. in depth. The tumor is very firm, almost globular, with somewhat irregular surface, and does not appear to have been adherent to the dura. It is 4 cm. in width, 5.5 cm. in length, and 5 cm. in thickness from above downward. When cut it appears friable and resembles a fibrosarcoma. It has caused some pressure upon the fourth ventricle and thereby moderate internal hydrocephalus of the cerebrum, although the aqueduct of Sylvius is not much dilated and the fourth ventricle not at all. The third and lateral ventricles of the brain are moderately distended, especially the posterior horn of the left lateral ventricle, the floor of which is forced upward by the pressure of the tumor upon the under surface of the left occipital lobe. None of the cranial nerves is implicated in the tumor. The microscopic examination shows that the tumor is a fibrosarcoma.

The specimen is one of much interest. We often operate on tumors of the cerebellum, but I think I have never seen a tumor of the cerebellum which offered more favorable conditions for operation than did this tumor, situated as it was on the lateral portion of the left cerebellar lobe, and not infiltrating the cerebellum in the least. From its location it would have been seen as soon as an opening were made in the skull. The chances are that it would have been entirely removed, and that the patient would have recovered with no return of symptoms. As it is a fibrosarcoma and very hard, it is not likely that it would have recurred. Anyone interested in cerebral surgery cannot but deeply regret that operation could not have been done, as if it had been done the case would probably have been

one of the most brilliant on record. It is striking that there should have been involvement of the left external rectus muscle, because none of the cranial nerves were directly implicated in the tumor. The tumor being on the left side of the cerebellum, it must have distorted the left sixth nerve more than the right. It is remarkable that the right facial nerve was involved at all. The improvement of symptoms under iodid and mercury does not mean that a tumor is a gumma. We are all familiar with the fact that the symptoms of tumor often disappear under the administration of mercury and iodid, at least for a time. The early choked disc and the character of the neuroretinitis might have suggested that the tumor was in the cerebellum.

A YOUNG STAGE OF THE AMERICAN HOOKWORM —*NECATOR AMERICANUS* (STILES, 1902)— 8 TO 12 DAYS AFTER SKIN INFECTION IN RABBITS AND DOGS.

BY

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Dr. S. S. Adams, of Washington, D. C., recently sent us some feces from a patient with hookworm infection, who was treated in his wards at the Children's Hospital. Hookworm eggs were present in considerable number, but they were not so numerous as found in many other cases we have examined. These eggs were allowed to incubate and the infecting stage was then used to infect two rabbits and two dogs.

The fluid from the cultures was dropped upon the back of the experiment animals, which were then kept under observation for several hours, every precaution¹ being taken to prevent any infection by the mouth. The two rabbits were examined 8 and 9 days, respectively, after infection, the two dogs 12 days after infection. In all four cases young hookworms were found in the small intestine, and in one dog in the stomach also. These worms agree essentially in structure, and, although none of the infections were severe, no question arises in our minds regarding their being young hookworms.

In length, five of the young parasites measured 0.92, 0.96, 0.992, 1.29 and 1.64 mm.; the extremes (0.92 and 1.64 mm.) were obtained from dogs, namely, 12 days after infection. The diameter in most cases did not exceed 52.8 μ , but the specimen 1.64 mm. long, gave a maximum diameter of 112 μ ; this diameter, however,

¹The technic used was not exactly the same in all four cases. In some instances the hair was shaved from the back of the animal, in other cases not; in some instances the culture medium itself was applied to the skin, in other cases water containing the larvae was dropped slowly on the skin; in one case the animal was kept under morphin for about three hours, in the other cases they were simply secured in such a way as to exclude any possibility of soiling the mouth with the infectious material; in all cases the animals were kept under observation several hours, in order to prevent infection per mouth; then the skin, at and around the point of infection, was thoroughly washed with alcohol and then dried, before the animals were returned to the kennels. From the extreme care exercised, we consider an accidental infection per mouth as excluded.

was obtained after the specimen was mounted, and undoubtedly exceeds the normal. The cuticle shows a distinct but very fine transverse striation. The mouth is terminal or practically so, for the dorsal curvature of the anterior end is evident in only a few cases, and then to only a very slight degree. In a specimen 0.992 mm. long, the cervical papillæ are 162.8 μ from the anterior end, and the body is 50.6 μ in diameter at this point; in another specimen, from a dog, length not taken, the cervical papillæ are 220 μ from the anterior end. In only two specimens was the ventromedian excretory pore noticed, its location being about at the equator of the esophagus. The nerve ring is visible. The anus is on a slight elevation, with a semicircular opening, the concavity being directed caudad; its distance from the tip of the tail varies in different specimens, the measurements obtained being 48.4 μ , 57.2 μ , 66 μ , 79.2 μ , and 88 μ . Caudad of the anus, the tail decreases in lateral diameter, at first rather gradually and regularly, but near its tip it decreases much more suddenly and ends in a fine point.

observed on the cuticle, but these have not yet been studied in detail.

The esophagus varies some in size in the different specimens, as the following measurements show:

198 μ long, 22 μ in diameter anteriorly, 48.4 μ in diameter posteriorly; worm from a dog, 12 days after infection.

202 μ long, 22 μ in diameter anteriorly, 22 μ at equator, 39.6 μ posteriorly; worm 0.92 mm. long, from dog, 12 days after infection.

264 μ long, 26.4 μ in diameter, 141 μ from its buccal end, then it swells to 48.4 μ in diameter.

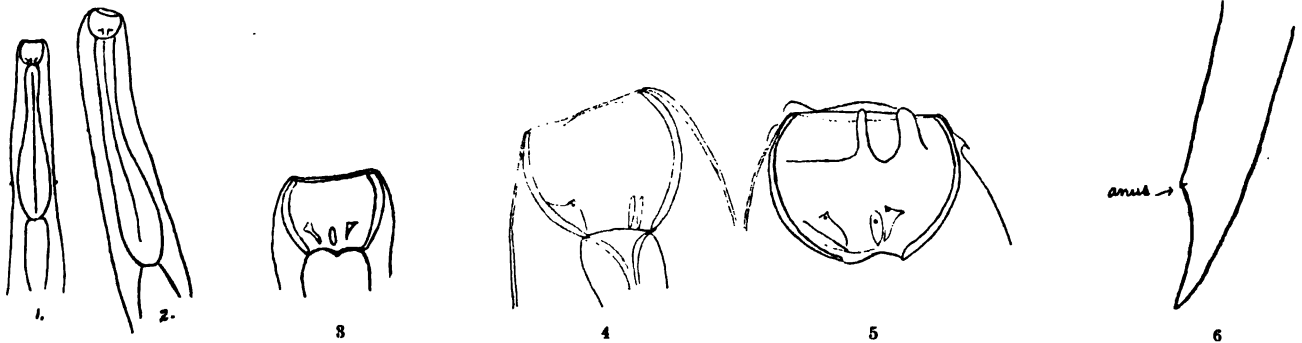
288 μ long, worm 1.64 mm. long, from dog, 12 days after infection.

290.4 μ long, 35.2 μ in its greatest diameter.

Length (?), 19.8 μ diameter anteriorly, 35.2 μ posteriorly.

Length (?), 26.4 μ diameter anteriorly, 26.4 μ at equator, 50.6 μ posteriorly; worm from dog, 12 days after infection.

Thus, the esophagus varies from 198 to 290 μ in length. Its structure is entirely different from that of



Figs. 1-2.—Two outlines of anterior portion of young specimens of *Necator americanus*, showing mouth, provisional buccal capsule, esophagus, and anterior portion of intestine; Fig. 1 also shows three teeth in the esophageal end of the buccal capsule, and the two cervical papillæ; Fig. 2 shows only two of the teeth. Greatly enlarged. Figs. 3-5.—Three outlines of the provisional buccal capsule of young specimens of *Necator americanus*, showing the paired ventral teeth and the unpaired dorsal tooth; Fig. 5 is slightly damaged on one side, but it shows three oral papillæ and one lip (?). Greatly enlarged. Fig. 6.—Outline of tail of young specimen of *Necator americanus*, to show position of the anus. Greatly enlarged.

The buccal capsule varies in size, as the following measurements show: 35.2 μ long by 39.6 μ in diameter; 35.2 μ long by 41.8 μ in diameter; 39.6 μ long by 39.6 μ in diameter; 39.6 μ long by 44 μ in diameter; 39.6 μ long by 57.2 μ in diameter; 41.8 μ long by 41.8 μ in diameter; 41.8 μ long by 52.4 μ in diameter.

One side of the capsule is slightly longer than the other; in one case the longer side measured 44 μ long, the shorter 39.6 μ long. We interpret the longer side as ventral, the shorter as dorsal, as the longer side corresponded to the anal side in two specimens in which no torsion was visible; and further, since it is the ventral side of the capsule, which is the longer, in the adult worm. Lips could not be recognized with absolute certainty, but in one specimen in particular it appeared as if two delicate lips were present. Only three teeth (8.8 μ long) could be seen at the esophageal end of the buccal capsule; two of these are situated on the longer (ventral) surface, and hence would represent a pair of ventral lancets; the third tooth is located on the shorter (dorsal) surface of the buccal capsule, thus corresponding in position to the "dorsomedian tooth" of the adult.

On the anterior end of the body, several papillæ were

the larva, and resembles that of the adult form; the anterior portion is narrow while the posterior portion is swollen to nearly twice the diameter of the anterior end. Corresponding to this difference in diameter there is a great difference in its rigidity; in moving around, the worm is able to bend the anterior portion of its body with the greatest facility, from its mouth to the point where the esophagus begins to swell, and the anterior narrower portion of the esophagus bends without difficulty, while the swollen posterior portion of the esophagus is much more rigid and corresponding to this, that portion of the body of the worm is much less agile.

The intestine is well differentiated and at about the middle of its length the primordium of the genital organs was observed in several specimens; the sexes cannot be distinguished.

The worm as described in the foregoing apparently corresponds to the stage of *Agchylostoma duodenale* described by Looss (1897) as the fourth stage (with provisional buccal capsule), namely, the stage following the third ecdysis. We observed no specimens in process of ecdysis, but the differences in structure between the

stage here described and the infecting stage, justify the conclusion that ecdysis has occurred.

In a former publication, Stiles (1903, p. 20) reported observations on the earlier stages of *Necator americanus* as follows:

Eggs may hatch the rhabditiform embryo in less than 24 hours. (Claude A. Smith reports them as hatching in 12 to 24 hours or longer.)

First stage (rhabditiform embryo) may be found in first ecdysis 2 to 3 days after hatching.

Second stage may be found in second ecdysis 7 to 9 days after hatching of first stage from the egg. This is now the infecting stage.

The third stage of *Necator americanus*, namely, that resulting from the second ecdysis, has not yet been observed in the body. For *Agchylostoma duodenale*, Looss has shown that this stage may pass from the stomach to the small intestine; it begins to feed, but its growth is slow; after about five days it begins to show signs of the third ecdysis, which continues until about the seventh day; upon casting its skin, the worm enters the—

Fourth stage (with provisional buccal capsule). This is the stage now described for *Necator americanus*, as occurring 8 to 12 days after infection. These worms must next undergo a further (fourth) ecdysis, during which the sexes will become differentiated. In case of *Agchylostoma duodenale*, Looss states that this ecdysis occurs about 14 to 15 days after infection, when the worms enter the—

Fifth stage (with definite buccal capsule), which then develops directly to the adult form.

In one instance we were able to observe a young worm attach itself to a villus of the intestine, which happened to be on the slide; the worm placed its mouth against the villus, and by repeated swallowing motions, drew, by suction, a portion of the villus down into the buccal capsule until it reached the lancets at the esophageal end of the capsule; after retaining this position for about 15 minutes, the worm moved away from the villus.

At this point in our observations our work was suddenly interrupted by the yellow fever outbreak, and it may be some time before it can be carried further, but we publish this short note to show that (1) Both dogs and rabbits can be experimentally infected with a young intestinal stage of the American hookworm (*Necator americanus*, *seu Uncinaria americana*); (2) if the infecting stage is placed upon the skin of the back, it penetrates the skin, and 8 to 12 days later it has reached the stomach and small intestine, and has undergone changes (undoubtedly with ecdysis) in its structure which differentiate it very distinctly from the infecting stage, but at these dates (8 to 12 days) the worm also differs radically from the adult stage.

Although both rabbits and dogs may be infected with this young stage, there is no evidence that these animals play any role in the spread of uncinariasis in man, for there is at present no evidence that these worms would reach maturity and reproduce in either the rabbit or the dog.

SUBCUTANEOUS PELVIOURETERAL LUMBAR IMPLANTATION, IN LIEU OF URETERECTOMY AFTER NEPHRECTOMY.¹

BY

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Is removal of the ureter after nephrectomy advisable, desirable, or necessary? My own answer to this important question can best be stated by a recital of the history, method of operation, and outcome of the case which lead up to the conclusions hereafter stated.

April 19, 1904, in response to a call from Dr. L. H. Moss, I saw Mrs. S., aged 29, mother of three children, the last born December 25, 1899, instrumental delivery. May 5, 1900, Dr. E. B. Cragin removed bilateral ovarian dermoids and left pyosalpinx, with the uterus. From April 10 to 16, 1904, she has been suffering with pleuritic pains in the right side, which have subsided. Three days ago, after fooling and jumping with the children, she felt something give on the right side, just below the chondral border, followed by a constant stitchlike, but not severe pain. Since the operation of four years ago, her right side has always been weak.

Examination: Patient well nourished, somewhat anemic. Right kidney tender, lower pole palpable; greater curvature of the stomach on a level with the umbilicus. Highest temperature yesterday, 103° F.

Diagnosis: Hydronephrosis from prolapsed kidney. I elevated the foot of the bed and applied Rose's plaster binder.

April 22: Urinalysis showed pus and caudate and conical cells from the kidney pelvis, indicating pyelitis.

April 24: Cystoscopy showed bladder normal, urine discharging from the left ureter, but owing to a defective lamp I was unable to pass a catheter into the ureter.

April 30: Very few streptococci and staphylococci found in urine, and no tubercle bacilli.

May 1: Urine passed, 38 ounces; May 2, 44 ounces.

As the pain continued and the patient was losing ground, and the distention in the right loin continuing very great, it was decided to bring her to town, catheterize the ureters, and be guided by our findings. After considerable difficulty, Dr. W. Ayres succeeded in introducing a catheter into the pelvis of the left ureter, withdrawing enough urine for examination. On the right side, however, the catheter could not be passed higher than four inches, nor could any urine be drained therefrom.

Diagnosis: Ureteral stricture in scar of former operation. Dr. Louis Heitzman reported that the catheter specimen from left ureter showed pyelitis.

Operation was done May 23, at 7.45 a. m. Pulse 92, temperature 99° F. Dr. Ayres assisted. Dr. Moss administered ether. An oblique incision, six inches long, was made through the skin and through the muscles and fascias by splitting with the fingers. On attempting to free the kidney, a perinephritic abscess at its anterior and upper part was opened. The enlarged kidney (6x4x2½) pelvis, and ureter were very markedly distended down to and below the pelvic brim. After freeing the kidney, its size was diminished by drawing off several ounces of purulent fluid, and the artery and veins ligated with black silk. After cutting the kidney free from the ureter, a probe was introduced down to a point apparently corresponding to that at which the catheter was blocked from below.

¹ Read before the Surgical Section, New York Academy of Medicine, October 6, 1906.

The ureter was sutured into the lower angle of the lumbar wound, its mouth opening outside the lumbar fascia, into the subcutaneous fatty tissue. The muscles were sutured in three tiers, and a gauze drain carried down to the vascular stump. A small wick of gauze was inserted into the mouth of the ureter and brought out on the surface. The skin was partially closed with silkwormgut, and dressed with balsam oil.

After a rather stormy first week the pulse and temperature subsided, the discharge diminished, and the general condition rapidly improved, so that on the tenth day she sat up in a chair for 45 minutes, and on June 7, the fourteenth day after operation, returned to her home on Long Island, the discharge having almost ceased.

On June 10, Dr. Moss found both openings closed and temperature 103° F. Both points were reopened and considerable pus let out, the temperature dropped, and the patient was able to get about the house. August 29, the black silk ligatures were extruded from the wound, which closed again in September. The last of the silk

ligatures was extruded in December, 1904, and the wound has been quiescent ever since.

The patient's height is 5 feet 1 inch. Immediately after operation she weighed 100 pounds. At this writing she weighs 135½ pounds, and is in excellent health.

Schede¹ says: "That while removal of the whole (tuberculous) ureter is desirable, it adds considerable risk to an operation which is already severe, and the prolonging of the narcosis may have a serious effect upon the remaining kidney. There is also reason to suppose that tuberculosis of the ureter may disappear spontaneously when the affected

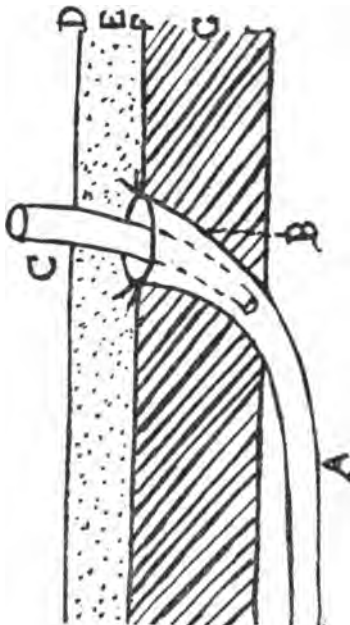
a few drops of purulent secretion from such a ureter will give the patient little trouble."

Technic of Subcutaneous Lumbar Pelvioureteral Implantation.—After the kidney has been delivered and the renal vessels securely ligated (occasionally it may be necessary to expose the ureter and pelvis and resect before tying the vessels), the kidney is freed from the ureter by cutting across the pelvis at about an inch above its junction with the ureter, thus leaving a funnel-shaped opening into the ureter which must be sutured to the lumbar fascia in such a way that the mouth is not exposed on the skin surface, but opens into the subcutaneous fatty tissue. The flaring of the funnel makes suturing very simple; the introduction of a drainage-tube easy; and the mouth does not contract. When the discharge ceases the skin readily closes over the outlet and buries it, but should pus or mucus reaccumulate, a simple incision through the cuticle releases the pus, and drainage can again be established. Refilling is announced by pain, fever, and bulging at the site of the implanted ureter, but by this method there can be no involvement of the retrocolonic space nor any of the deep structures.

Vaginal Implantation of the Ureter.—After nephrectomy for tuberculous kidney, pyonephrosis without ureteral obstruction, it might be well to afford additional drainage and divert the ureteral secretion from the bladder by resection of the vesical end (after introducing a catheter into the ureter), exposing the ureter, through the vaginal wall, cutting across, closing the vesical stump, and suturing the proximal end into the vaginal wound, that the ureter may drain directly into the vagina, where it can do no harm.

Subcutaneous lumbar pelvioureteral implantation appeals to me as being simple, safe, and satisfactory, in that by this procedure we (1) avoid the additional risk of immediate ureterectomy; (2) secure free drainage and maintain an opening through which drugs may be introduced to hasten retrograde changes; (3) on the other hand, the opening being beneath the skin does not prevent primary union; avoids exposure on the skin surface; should mucus or pus accumulate it cannot burrow in the retrocolonic space, is easily recognized and let out through a small skin incision and a tube inserted for drainage; the absence of ligature on the ureter prevents deep inflammation, and if the ureter must for any reason be subsequently removed it can be accomplished without difficulty, from a patient who has had ample time to recuperate from the primary operation. The presence of the drainage-tube in the ureter, with or without the vaginal implantation, does not interfere with the patient in getting out of bed at an early date after operation, nor the exercise of her usual home duties.

The only precaution necessary is to see that the skin opening is not permitted to close so long as the discharge persists, but the presence of a drainage-tube and dressing in no way interferes with the pursuit of the patient's usual vocation, or pleasures. However, if the opening does close and secretion reaccumulates in the ureter, the patient will suffer pain, a rise of temperature, and bulging of the skin over the site of the ureteral opening. A small incision through the cuticle will at once give



A, ureter; B, stump of renal pelvis sutured to lumbar fascia; C, drainage-tube; D, skin; E, subcutaneous fat; F, lumbar fascia; G, lumbar muscles.

kidney has been removed. Therefore, Schede extirpates the ureter so far as this can conveniently be done, and sutures its stump in the lower angle of the wound after curetting away the mucous membrane and burning the lumen with the Paquelin cautery. The ureteral stump is later treated with injections of iodoform, lactic acid, etc. He followed this treatment in 22 cases after extirpation of a tuberculous kidney, and of the 16 patients who recovered not one was troubled with a permanent fistula."

Schede² also states: "Whenever primary or secondary nephrectomy is carried out, it is well not to bury the ligated ureter, but to suture it into the wound. One will thus avoid the unpleasant formation of a 'ureteral empyema.' This action is especially necessary when there is obstruction between the kidney and the bladder. Still, suture of the ureter in the wound does not always prevent retention of pus, which will sometimes require total extirpation of the ureter. The daily discharge of

relief, and a tiny drainage-tube facilitate the exit of mucus or pus. As atrophic changes in the ureter take place, the secretion will cease and the opening will close permanently.

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DECEPTION AND FALSEHOOD AS PATHOLOGIC PHENOMENA.

BY

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In normal life there are occasions when telling an untruth is a necessity, as for example, in cases in which the instinct of preservation demands it. Normally, lying is an act performed with a certain reasonable motive and in proportion with the cause. But when it is done without a sufficient motive, when it is persistent and out of proportion with the cause, when it is done against the individual's own interest, in other words, when it is illogical, such a phenomenon should certainly be considered morbid. However, the latter condition is observed at a certain period of normal life, viz., in infancy. At this age the psychic domain is extremely limited; power of criticism and power of control are wanting. The child leads a life full of creative imagination and free from inhibition; the child is extremely subject to suggestion. Exaggeration, misrepresentation of facts, recital of impossible and never occurring events, are in a child all the result of errors of perception and misinterpretation.

The lies, which, as we have seen, are a natural product of the rich and vivid imagination and suggestibility, gradually take the place of the conception of truth, and finally eliminate it completely; autosuggestion is the consequence. The latter condition leads to simulation, which is a lie of a higher and more complex order. At first, therefore, the act is involuntary, but later becomes voluntary. Facts of this character are abundant in psychologic literature. Duprat cites a case of a little girl of 4, who, after having been present at the departure of a steamer from a port, gives a most detailed account of all the adventures that occurred to her during her (imaginary) voyage on a ship. Another little girl imagined the death of her little sister (which was incorrect) just for the pleasure of being consoled.

This condition makes its appearance in a child from the moment the psychic life becomes active, increases gradually during the first few years, but then imperceptibly decreases, and disappears at puberty in normal individuals. This is a natural physiologic cycle of events. Should the condition persist instead of disappearing, we have then to deal with a pathologic condition. The subject is of great practical importance from diagnostic, therapeutic, and medicolegal standpoints.

A pathologic tendency for exaggeration, for telling

untruths, for inventing impossible events, may be present in an adult as well as in a child. In both cases it can be considered as a stigma of mental degeneration. What characterizes it, is the duration, the intensity of the morbid condition, and mainly the association of this morbid activity with other degenerative features in the intellectual and moral spheres; the latter influence the first, inspire and direct its acts, excite vicious or perverted desires.

Various forms of cerebral abiogenesis, manifesting during life general mental arrest and idiocy, embrace among other symptoms also those pertaining to our subject. Men that had unusually large opportunities to observe idiots, like Bourneville, for example, state that deception and falsehoods are precocious symptoms. But there is a far larger class of young individuals, so-called degenerates, who present these morbid symptoms to a more pronounced degree. These intellectual weaklings do not progress with their age; they are psychically infants, are deprived of power of reasoning, of criticism. They are easily influenced, they are highly suggestible. While in some cases these youths show the tendency for lying, for misrepresenting facts, etc., a tendency which leads to harmless consequences, in another group of cases the brutal and perverted instinct is the main feature. In the latter case, malice, hatred, jealousy, revengefulness, cruelty, desire for destruction, are the manifestations of such young degenerates. These young monstrosities show a precocious criminal instinct, which is so important properly to interpret from a legal standpoint. We find in medicolegal literature abundant examples of accusations made by children against parents; they do not hesitate to accuse the latter of most monstrous crimes. I remember the case of a little girl who, having a grudge against a brother who frightened her, accused him falsely of assault—the act of which she described in minutest details, to the horror of the audience. Vanity, the great desire for notoriety, is another reason for telling falsehoods in these perverted individuals. Dupré,¹ who made a special study of this subject, cites among other examples the case of a little girl who accused a perfectly innocent man of an assault. A close questioning disclosed that it was a falsehood, and she explained the reason of her lying by her great desire to appear in public before the coroner, as this was so much praised by her friend a short time before the inquest.

If we now turn our attention to adults, we find the spontaneous and constant tendency to falsehood and deception mentioned mostly in young individuals and again in those qualified as degenerates. The difference between the adult and the child lies in the degree. Although such adults present an infantile intellect, but the effect of years' observation renders them more proficient in accentuating the morbid tendencies described. There is an additional phenomenon, which is not at all or very exceptionally observed in children, but met in adults, viz., autoaccusation, which sometimes assumes a criminal character. In order to deceive and ridicule authorities, physicians, public opinion, and enjoy the effect of their lies, they will accuse themselves of the

¹ Bull. Méd., 1905, No. 23.

most improbable crimes, which they have perhaps read in the press immediately before.

I have said that mentally defective children are particularly inclined to autosuggestion. The same feature is observed in adults. Cases of imaginary assaults told by the victims in the most picturesque manner, are abundant in medicolegal literature. This crime is apparently the most favored among women. The reason of it probably lies in the interest, curiosity and sympathy manifested in public opinion for the unfortunate victim. Frequently these women are happy, feel flattered to come to public notice.

Vanity, moral perversity, deception practised in the manner as indicated, are symptoms of a pathologic condition; they are closely allied to mental degeneracy and loss of psychic equilibrium, they are manifestations of the so-called "moral insanity." However, there is a certain relationship between these symptoms and hysteria. Suggestibility, autosuggestion, simulation, are all met in this great neurosis, but they are usually produced involuntarily or unconsciously, while vicious tendencies, falsehood, deception and simulation, accomplished intentionally and consciously, belong to an entirely different order of psychic disturbances than hysteria. The latter are the result of an originally abnormal psychic make-up. The practical importance of this knowledge is too obvious to dwell upon. The medicolegal deductions of this study are of the highest sociologic interest. We have seen first of all how much reliance we can place on testimony of children. In such cases, the element of suggestion should always be taken into consideration. Monstrous accusations, autoaccusations should be thoroughly investigated, should always be looked upon with suspicion and placed in the hands of medical experts. It is the alienist that should decide upon such cases, as they belong entirely to the domain of medicolegal psychiatry. It is true that public opinion is not yet prepared to consider as mentally diseased, individuals who are capable of combining various forms of perversion with intellectual resourcefulness, but alienists should unceasingly continue to work against such misconceptions, and in the name of justice, correct legal errors when responsibility is recognized in individuals who are not responsible for their crimes.

The Creeks' Medicine Man.—The medicine man of the Creeks will not eat anything scorched in cooking; in treating a gun or arrow-shot wound he as well as the patient will fast four days, only drinking a little gruel. He will not allow a woman to look at his patient until he is well or dead. If his patient dies the medicine man takes a lot of medicine himself in order to cleanse himself from the fumes or odor of the dead. The pallbearers, as we might call those assisting in the burial, also take the same cleansing process. And again when an Indian committed murder, even in self-defense, he went to the medicine man and took the cleansing remedy, claiming the remedy appeased the crime and the trouble to his mind. The medicine man has a horror of women, keeping out of their company as much as possible. At the full of each moon it was the custom of the bucks to drink medicine made by the medicine man to cleanse their systems. In camp the Indian killed nothing which was not eatable.—*The Indian Journal*.

SPECIAL ARTICLES

THE MEDICOLEGAL ASPECT AND CRIMINAL PROCEDURE IN THE POISON CASES OF THE SIXTEENTH CENTURY.

BY

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In the long chain of history one is constantly meeting mysterious deaths seizing vigorous people in robust health. The subjects usually occupy some high position and disappear just at the time when their presence becomes an obstacle to an heir or a competitor. One immediately has the feeling that all these deaths are merely instances of homicide, although there are no absolute proofs in favor of this hypothesis. Blood was not shed, the sword leaves no trace, nobody saw the assassin accomplish his crime, and, nevertheless, general opinion refuses to believe that all these victims died natural deaths. They designate certain people by the terrible and detested name of poisoner. In point of fact, poison has played a great part in history and was a much too convenient arm to be left aside, and it is always found in the hands of those who, devoured by ambition, had not the courage to end their desire by the price of an outright murder. The latter had the misfortune of leaving some trace behind, which, sooner or later, would denounce the culprit, while poison would only leave a doubt as to the true nature of death, and, for this reason, in all times it was employed in order to avoid intrigue. Poison was the arm of the aristocracy, and kings did not disdain it, so that an example starting from so high a source was naturally followed by the courtesans in the first place and the people afterwards.

The true home of poison was the Orient, and the princes of Asia, tired of bloody spectacles, searched for new voluptuousness by witnessing the effects of poison given to their slaves, and consequently the history of Asia represents a long chain of dramas from death by poisoning. From the Orient this method came to Greece, but without making much impression there, because the loyalty of this people made them repugnant to such crimes, and they reserved poison for those they wished to put to death legally. In imperial Rome, things were not the same, and the then reigning conditions represented an essentially favorable midst for the development of homicide by poisoning, and such instances rapidly became numerous. During the Middle Ages this crime appeared to be rare in France. This, however, does not mean that poisons were not known, because their use has never been forgotten, but they were hardly employed anywhere but at the Court and by high personages. Among the people, sorcerers were the only ones to resort to their use, and the ointments that they prepared only occasionally resulted in accidental death.

Suddenly, without hardly any transition, the Renaissance came to light. The Italians invaded France, giving this country all the great advances that the former had made in the culture of arts and sciences, but at the same time they brought with them their deplorable

morals. Sensual and artistic, the princes of the Italian courts searched for art even in the way of giving death. To the grossness of the sword, which struck too openly, they preferred poison, which slowly infiltrated the veins and killed the strongest in the midst of feasts and fêtes, without the loss of a drop of blood. They taught to France the most refined means of getting rid of those who came in the way, and they showed all the advantages derived from mineral poisons and taught the secret of the fearful poisonous compositions.

Catherine de Médicis arrived at the court of France followed by a band of devoted Italian courtiers, who would obey any order, no matter what its nature, that she might give. She belonged to a family who had become sadly celebrated by the innumerable forfeits that it accomplished, and especially by its murders from poison. At the court she continued the traditions of her ancestors with the aid of the Florentine René, who furnished her all the necessary poisons for the accomplishment of her designs. All the high positions were occupied by Italians, who brought the customs of their country into use. Poison was immediately chosen as one of the most suitable arms, all the more so as it assured impunity to the culprit.

In point of fact, physicians were at this time unable to recognize its traces in the cadaver, and autopsies only gave very vague information, while experimental researches had not as yet given the medical profession its precious concourse. Medical men occasionally were able to establish the reality of a death by poison, but they hesitated to announce the fact, because the discovery of the criminal might bring the hatred of some high personage upon them, whose influence was necessary. It was among the aristocracy that the poisoning habit first developed, and the court adopted this means with eagerness, so that the judgment that Trémoille handed down regarding it was never so true as during the Renaissance, which represented a combination of greatness and baseness. "The Court is an ambitious humility, a lubric chastity, a furious moderation, a tiresome love, a corrupted justice, a hungry abundance, a miserable highness, a state without security, a contempt of virtue, an exaltation of vice, a dying life and living death; the highest are in greater danger than the lowly, because fortune does not smile upon the security of the great."

From the court poisoning reached Paris and the nobles imported this crime into the provinces, but it is not probable that it penetrated into the country, and it is more likely that the peasants, as at the present time, used their natural arms to settle their quarrels without having recourse to these complicated procedures.

What was the role played by the physician in cases of poisoning, what means he had in his possession to detect the trace of poison, and what help could the medical art give to justice in the sixteenth century are all questions which are most interesting to solve, because it was at this time that forensic medicine was created. It was to the genius of Ambroise Paré and his students, Cardan and Porta, that this science was brought out from obscurity and the immense service that it has since rendered to justice is well known. It had not at that time all those means of investigation which it today pos-

sesses, but one is obliged to admit that it acquired a very rapid development, and that from its very commencement it was attentively followed by the legal profession. Without attaining the proportions that it reached during the following century, homicide by poison had become sufficiently frequent for justice to become disturbed and it formulated special laws and punishments. Jousse, in his "*Traité de la justice criminelle en France*," published at Paris in 1771, tells us that the judges understood by the word poison "all drugs or chemic preparations capable of giving rise to death," and by poisoners, "those who employed these means for killing other people." Love philters and abortive drinks were not considered, properly speaking, as poison, but they entered under this head when they caused the death of people to whom they had been given.

This definition having been established, let us consider how the criminal procedure at this epoch was carried out. When a person in perfect health was suddenly stricken by illness, especially when this occurred after a repast, opinion was never wanting to attribute the death as the result of a crime. As traces of violence could never be detected, these deaths were immediately placed in the long list of the poison dramas. The news circulated from mouth to mouth and the criminal was not long in being indicated under breath. In possession of these suspicions, justice immediately commenced an inquest, and its first act was to designate the physician to examine the victim.

One of two cases was then presented; there had been only a simple attempt, and the person to be examined was living and could himself give all the necessary knowledge to the physician, or, on the other hand, the victim had died, and an autopsy alone could verify or destroy all suspicion of poisoning. In the former case the physician based his opinion on the symptoms of poisoning, which, according to Ambroise Paré, were the following:

We recognize that a man has been poisoned, no matter in what way, when he complains of a great weight throughout the body, which makes him displeasing to himself; when the stomach gives him some horrible taste in the mouth, entirely different than that derived from ordinary meat, no matter how bad it may be; when the color of the face changes, being either livid or yellow, or any other strange tint, and deformed; when he complains of nausea and the desire to vomit; when he is possessed of an uneasiness of the entire body, and it seems that everything about him is turned upside down; when without appearance of great or marked heat or cold, the patient falls from heart weakness accompanied by a cold sweat.

To these symptoms, which were always observed, other particular signs were noted with each kind of poison, which sometimes allowed the diagnosis of the substance given to be made. Beside the physician found a precious auxiliary in the examination of the vomited matter, but at this epoch, chemic research being unknown, this examination was merely an illusion. This can readily be seen because it would be very difficult to recognize the nature of a poison by the color and odor of the stomach contents, but nevertheless physicians could establish the reality of death by poisoning by the procedures that we have mentioned, which, at this time, were the only ones which could be utilized.

When the victim had died, an autopsy was performed, and if the body was livid, covered with spots, exhaling a very bad odor, with black nails, which were hardly attached to the fingers, with foam at the mouth, there were already very strong presumptions in favor of death by poisoning. If examination of the interior of the body revealed indications of corrosions in the esophagus or stomach, black spots in the intestines, and congealed blood around the heart or in the stomach, there was no longer any doubt, so that the hypothesis was fully confirmed. If the poison was found in any of the organs it was sometimes experimented with on animals. All these means were extremely small in order to make so serious an accusation, but the physician of the sixteenth century could not do more than what the progress of science had up to that time taught them. Toxicology was at this epoch absolutely unknown, and it was only later, under the influence of all the serious cases of death by poison, that it was finally built upon solid basis.

When in possession of these facts the physician wrote out a report which was handed over to the courts and, as an example of one of these, I here translate one given by Ambroise Paré in his work :

M. de Castellan, physician in ordinary to the king, and master Jean d'Amboise, surgeon in ordinary to the king, and myself, were sent to open the body of a certain personage that one suspected of having been poisoned, because, before having supped he had not complained of any pain. And soon after supper he complained of a severe pain in the stomach, crying out that he was suffocating, and the entire body became yellow and swollen, unable to breathe and panting like a dog who had ran a long distance; because the diaphragm (principal instrument for the respiration) being unable to have its natural movement redoubled its action and thus hastened the course of respiration and expiration; then he had vertigo, spasm, and failing of the heart and consequently death. Now in truth in the morning we were shown a dead body, which was completely swollen just like a sheep that had been blown up in order to be skinned. The said d'Amboise made the first incision, while I withdrew behind, knowing that a cadaverous and stinking exhalation would come out, this which did occur, and which all those present could hardly endure; the intestine, and generally all the internal parts were greatly blown out and filled with air; and thus we found a large quantity of blood which had escaped into the entrails and the cavity of the thorax, and it was concluded that the said personage might have been poisoned by the crapsudin poison.

I will now give another medicolegal report, although it was written much later, because it shows to greater advantage than the preceding one, which in reality is merely a simple recital of an autopsy, how those reports were made out. I translate it from "*Doctrine des rapports de chirurgie*" by Nicholas de Blégné, published at Lyons in 1684.

Reported by us, master surgeons sworn, in the city and jurisdiction of Lyons, that this day, September 18, 1682, in execution of the ordinance of the Lieutenant-General, we went to rue des Landes, in a house which bears as sign the image of Saint Margaret, in order to visit the dead body of Suzanne Pernet, a sworn matron, having found all the external parts in their natural position, we then proceeded to the opening of her body in the presence of master Claude du Pradel, doctor of medicine, appointed to the place by the Lieutenant-General; and having commenced by the abdomen and afterwards opened the stomach, we found it completely cauterized in its fundus, which contained a black, sandy liquid in quantity about as much as an eggful, which, having been placed by us in a metal

vessel, stained it, as would be done by acid and corrosive liquids and which having been given in a small quantity to a dog, acted on him severely, as we were able to recognize by his cries and howling, all of which made us consider that the said Pernet had been poisoned by arsenic or sublimate, or other such corrosive poisons of the mineral gender; in which we were all the more confirmed by the excellent condition of all the other intestinal parts, as much in the abdomen as in the chest and head, which we had likewise opened, and where we found no cause for death, all of which we certify as true, in faith of which we have, with the said Master du Pradel, signed the present report, in order that it may serve whom it may concern. At Lyons the day and year mentioned above.

From these examples of medicolegal reports it at once becomes evident how little knowledge was gained by autopsies. The doubt still remained in suspense, and this is quite enough to explain the true reasons for the great number of deaths by poisoning in the sixteenth and seventeenth centuries. The accused, in spite of the most serious presumptions, always was hopeful of escaping death, because his guilt was always doubtful and the charges accumulated against him rarely resulted in an absolute certitude of his guilt. For this reason it was not until toxicologic researches had been carried out that the development of this form of crime could be stopped, which at the present time is one of the least frequent causes of criminal homicide. Arsenic, which was then the king of poisons, has since been almost completely given up by criminals, because toxicology allows one to discover the most infinite traces in the cadaver of the victim.

The penalties applied to poisoners varied according to the country, but in general these criminals were condemned to death and the type of execution only varied according to the local customs. It is to be remarked in the first place that in most instances the crime was committed by women, which is easily explained, because on account of the weakness of their sex they could not revenge themselves by the use of arms. The poison was a hidden arm, striking with certitude, and which perfectly fulfilled the natural dissimulation of their sex. Consequently, one continually finds in the texts of the epoch a distinction between the penalty applied to women and that to which men were subjected. According to the Caroline Constitution, Article 130, he who had attempted to take the life of another by poison was condemned to death. If the criminal was a man, he died on the wheel like a vulgar assassin, while if it was a woman, she was thrown into the water. It was also specified that the criminals should be dragged to the place of execution and that before the execution took place they should be more or less subjected to hot irons, according to their condition and the circumstances of the crime. In France the penalty of death was also inflicted to poisoners, while the type of execution varied according to the circumstances and also to the local customs. Sometimes they were convicted and sentenced to be burned. The closer the degree of relationship existing between the accused and the victim also was considered in giving the sentence, and a son who poisoned his father or his mother was punished as a parricide, and parents who poisoned their children or wives their husbands, entered under the same class.

The law established distinctions between those who

sold the poison and those who administered it, and in the same sense, it did not inflict the same sentence to those who had caused the death of their victim and those who had simply committed a mere attempt. All these laws are to be found exposed in Farinacius, and we will here reproduce them as they are given by Jousse :

It is, however, necessary to observe respecting those who prepare or distribute poisons for the purpose of poisoning somebody, or who buy poison with the same intention, that they should not be punished by the sentence of death only when they reduce their design in act, by doing something which may tend to cause death; and in respect to those who sell and distribute it, knowing the use that one will make, they should not be punished with the ordinary laws applicable to poison, only when the design of him who wished to poison has been placed in execution and followed by death, otherwise they should be punished by a lighter sentence (Menochius).

If he who has bought, composed, or prepared poison, in order to poison somebody, has not put his design into execution because he has been prevented, he should not be punished by the sentence of death, but only by a less serious punishment, according to the circumstances and the quality of the person.

For a still greater reason, this should be the case when it is repentance that prevented him from executing his design, and in the second case, the punishment should be still less than in the preceding case.

Such were the legal dispositions relating to poisoning, followed by death and to simple attempts. Physicians, apothecaries, veterinarians, and, in general, all people who, from their business, kept toxic substances, were allowed to sell them, but before giving them to a buyer, they should inquire as to the honesty of their client and the use to which he intended to put them. If these precautions were not taken and death followed, he who sold the poison was brought to trial in nearly the same capacity as the one who had administered it, and in many cases he was condemned to undergo the same sentence. Justice also applied laws to those who had committed several murders by poison, and the following are, according to Farinacius, the penalties that were applied to them :

Relative to those who poison the water of a well, or a fountain, in order to kill those who may drink at these places, they should be punished as homicides; and this should not suffer any difficulty, when somebody has drunk the water from this well, or from this fountain, which has caused death. But, if this occurred accidentally, it appears that the accused should not be punished by a death sentence, but only by some other arbitrary sentence.

As a conclusion to all that we have said relative to the laws applicable to criminal poisoners, I would quote the two following judgments rendered by the courts. By a judgment handed down July 15, 1585, and related by Imbert, in his "Institutiones Forenses," a young woman of Paris, named Marie Lejuge, daughter of a merchant in the same city, was hung and burned for having poisoned her husband, this act resulting from a blow that he had given her. In another decision handed down by the criminal court of Orléans on September 12, 1602, a young woman of 14½ years was convicted of poisoning her husband, who died, and she was condemned to be hung, her body burned, and her ashes thrown to the winds. She had given arsenic in milk to her husband after having been seduced by the curé of

the place. The curé's servant having been convicted for preparing the arsenic was, on Saturday, September 26, of the same year, condemned to be hung by the decision of the court, and was executed in the Place du Martroi d'Orléans, on Monday, October 26, of the same year. The curate, condemned for incest with this young woman, his parishioner, was condemned to be burned alive, and the decision was at once executed.

I can hardly terminate this chapter without making a few remarks relative to the legislation of love philters and abortive drinks, the following being the article of the Canon law relative to this question :

Those who give an abortive drink, or a love philter, even although they may cause no harm, and simply because the thing is a bad example, the culprits shall be condemned to the mides when in low condition, and in the case of nobles the confiscation of half of their worldly goods and relegation to an island; but, if from their fault, the woman or man shall have perished they are to undergo the highest sentence.

This text is exceedingly obscure, and lends itself to several interpretations. In the first place, what does it mean by woman or man? The first hypothesis that may be admitted is that the term man applied to an animated fetus, which, from this fact, was morally considered as a living individual, and from this it becomes evident that the word woman was used to designate the mother of the said fetus; or else the woman corresponds to the abortive drink and man to the love philter.

Without wishing to endeavor to settle this question it would appear that the last hypothesis is the most plausible. Now, in point of fact, the article includes two different things, namely the love philter and the abortive drink. For the latter there can be no doubt, because it was destined for women. As to the second it was used in the masculine sex as well as in the female, but the construction of the article very probably only considered those cases in which it was administered to a male subject. There is to be found successively those who administer an abortive drink, or a love philter and further on, "if from this fact the woman or man shall have perished"; these terms appear to well establish a near relationship between the abortive drink and the female on the one hand and between the love philter and man on the other. However this may be I consider, with Jousse, that there was not, properly speaking, any special legislation applicable to these particular crimes. Those who employed them sufficiently maladroitly to bring about death were considered guilty of homicide and were punished as such. The sentence was considerably increased when malice aforethought was added to the administration of a love philter. In the great majority of cases the courts were rarely called upon to interfere because these philters rarely gave rise to death. Drinks given to produce sleep, or to cause sterile women to conceive were assimilated to philters.

The Lepers of Poona.—The Mission to Lepers has secured in gifts and promises £825 towards the £1,000 required for its new asylum for the lepers of Poona (Bombay Presidency). A further sum of £175 would enable it to claim the grant promised by the authorities and to make proper provision for the many homeless outcasts of the district.

DIGEST OF MEDICAL LITERATURE

CLINICAL MEDICINE.

DAVID RIESMAN
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BERNARD KOHN

HELEN MURPHY

THE QUESTION OF "FOURTH DISEASE" AND
"FIFTH DISEASE."

A CRITICAL SUMMARY.

BY

BERNARD KOHN, M.S., M.D.

The history of the exanthematous diseases is one of successive differentiation. Measles was confounded with scarlet fever, and even with smallpox, as late as the middle of the eighteenth century, while rubella is a quite modern acquisition. In fact, so recent a work as "Nothnagel's System" devotes several pages to a discussion as to the identity and individuality of this latter disease. Its standing, however, has by this time been quite definitely accepted by the medical world, but the argument has been turned toward a further differentiation.

It seems that the term rubella has been covering at least two, and perhaps three separate diseases. Although the literature on the exanthems had contained low mutterings of the approaching storm for many years, the standard of revolt in the cause of the "Fourth Disease" was first raised by Clement Dukes (*The Lancet*, July 14, 1900). His claims were soon advocated by several authorities (Johnstone, Broadbent, Romer, Kidd, Weaver, Ashby, and others), while others (Millard, Washbourn, Rutter, Poynton, Williams, Ker, Griffith) denied the individuality of the new disease. The previous descriptions of rubella have usually recognized the existence of two forms—the morbillous and the scarlatinous. Some of the opponents of Dukes regard the "Fourth Disease" as a scarlatiniform rubella, while others believe it to be a mixed infection; still others a mild scarlatina, a desquamative scarlatiniform erythema, etc.

The "Fourth Disease" theory has received little encouragement in this country, but recently its cause has been taken up on the continent of Europe and has been rather strongly advocated. J. von Bókay (*Deutsche medicinische Wochenschrift*, 1904, No. 43, p. 1561) calls attention to the fact that Filatow in 1885 described a condition identical with that of Dukes under the name "rubeola scarlatina," he believing it to be a form of rubella. Bókay, therefore, first proposes the term "Filatow-Dukes' Disease." J. Ruhemann (*Deutsche medicinische Wochenschrift*, 1905, No. 3, p. 105) reports a small epidemic that he observed in 1898 before Dukes' paper appeared, and noted as "rubeola scarlatiniformis." Some of the cases had previously had scarlet fever, otherwise he might have made the diagnosis of mild scarlatina, so closely did the eruption resemble that disease. L. Cheinisse (*La Semaine Médicale*, 1905, No. 13, p. 145), after reviewing the literature in a most complete manner, decides emphatically in favor of the fourth disease and proposes the name "epidemic pseudoscarlatina." The latest word on the question has been said by O. Unruh

(*Deutsche Archiv. für klinische Medicine*, Bd. lxxxv, p. 1). He calls attention to the numerous cases observed by himself and many other physicians, which cannot be accurately brought under the head of either scarlatina, measles or rubella. The facts that these cases often occur in characteristic epidemics and always exhibit the same symptoms and course, that an attack may occur in a child who has already had scarlet fever and rubella, and that it does not protect from future attacks of these two diseases in those who have never had them, all tend to prove that we have to deal here with a separate disease entity.

The characteristics of the exanthem, as observed and described by Unruh, Røthemann, Bókay, and others, correspond quite closely with the original description of Dukes. It occurs almost exclusively in school children. The period of incubation seems to be about two weeks, but is put down at 9 to 21 days. It is not as contagious as scarlet fever or measles. In most cases there are no prodromes, although these may be present in severe cases. The rash consists of a closely punctated, very slightly raised erythematous blush, the color of which resembles that of scarlet fever, but may be a little more brownish. It appears first on the face, and in a few hours spreads over the entire body. The lips and nose are usually left free, and the eruption may appear patchy on the rest of the face, but the body and extremities are more uniformly covered. The rash fades rapidly, often in 24 to 36 hours, and is immediately followed by a slight desquamation in the form of minute scales (never in lamellas), which usually lasts at most two weeks. There is usually some injection of the pharynx and conjunctivas, but Koplik's spots and the strawberry tongue are never observed. Moderate fever of short duration is invariable, but the subjective symptoms are slight or entirely wanting. There may be very slight glandular enlargement, but it never reaches the proportions characteristic of scarlet fever, and especially of rubella. Complications or sequels have never been observed.

This symptom-complex differs from the typical descriptions of rubella in too many points to be regarded as a mere variety of that disease. This is especially true in view of the fact that the other exanthematous diseases always present a more or less uniform picture. So, although the idea of a fourth disease did not find much favor at first, this more recent accumulation of evidence seems to establish its independent status. If Filatow-Dukes' disease is finally accepted as a separate entity, it will probably include those cases which were formerly classified as a scarlatinous form of rubella, which latter disease will then embrace only the morbillous form. Of course a definite settlement of the question can only be obtained from a more accurate knowledge of the bacterial etiology of the exanthems.

In the meantime, however, still another candidate for recognition has appeared in the field. A number of authorities have independently described with remarkable unanimity of details a fifth exanthematous condition, which has heretofore been included in that heterogeneous symptom-complex, rubella. This "Fifth Disease" is fathered by Escherich, and first described under

the name of "local rubella" by his pupils, A. Tschamer (Jahrbuch für Kinderheilkunde, 1889, xxix, No. 3), and L. Gumpłowicz (Ibid., 1891, xxxii, No. 3). Further observations are recorded by Escherich's assistant, A. Schmid (Wiener klinische Wochenschrift, November 23, 1899), by Sticker (Zeitschrift für praktische Aerzte, June 1, 1899) under the name "erythema infectiosum," by L. Feilchenfeld (Deutsche medicinische Wochenschrift, August 14, 1902), under the name "erythema simplex marginatum," and by other observers. Plachte (Berliner klinische Wochenschrift, February 29, 1904) calls it "megalythema epidemicum," which term is also adopted by L. Cheinisse in a critical review (La Semaine Médicale, May 3, 1905). The only notice accorded this condition in America is in a paper by H. L. K. Shaw (American Journal of the Medical Sciences, January, 1905), who gives it an independent status quite distinct from both rubella and Dukes' fourth disease. He says that other exanthems afford no immunity from "erythema infectiosum," and no outbreak of measles or rubella follows exposure to its contagion.

The disease always occurs in epidemic form, is most frequently associated with an epidemic of measles or rubella, and usually attacks children between 4 and 12. The period of incubation varies from 6 to 14 days, but is never as long as that of rubella. The eruption usually announces itself without prodromes, and appears first upon the face, especially on the cheeks. The skin becomes the seat of a rose-red efflorescence, which is hot to the touch and is raised above the surrounding surface. There are absolutely no subjective sensations of heat, pain, or itching. The eruption is usually confluent upon the cheeks, is sharply demarcated by an irregular border, and usually spares the nose, lips, and chin. The appearance is very much like that of erysipelas. The fundamental elements of the eruption are maculopapules. In 24 to 48 hours it begins to fade from the center toward the periphery, and at the same time an analogous eruption appears on the extremities. Here the rash is more apt to be in the form of patches of varying size, giving more of a morbillous appearance. The extensor surfaces are especially affected and the eruption progresses from the proximal to the distal end of each extremity. As the patches fade in the center, the skin may assume a marbled appearance. The eruption almost invariably spares the trunk altogether. The mucous membranes are never affected, the scarlatinal tongue never develops, the lymphatics are not enlarged, and there is seldom any fever. Subjective symptoms are usually wanting. The total duration of the affection is 6 to 10 days.

Here is a condition which is at greater variance than is Dukes' disease with the other exanthems, and the same arguments that apply in the former case are also brought forward here to give this "Fifth Disease" an independent status. The evidence is still too scanty upon which to base a positive conclusion, but the opinion of those prominent pediatricists who have already described and accepted the disease is not to be regarded lightly. It is to be hoped that further observations in this country will help to solve the problem, both of the fourth and of the fifth disease.

DISEASES OF THE LUNGS.

Bacteremia in Pulmonary Tuberculosis.—Previous investigations concerning the occurrence of bacteremia in the septic stage of pulmonary tuberculosis give varying results. This may be due to poor technic in many cases, as the later experiments with improved methods usually have given negative results. G. Jochmann (Deut. Archiv. für klin. Med., Bd. lxxxiii, p. 558) has investigated this question in 40 cases of pulmonary tuberculosis, all of which were in advanced stages, mostly with cavities, and with high fever. In all cases the results were constantly negative, even in the agonal period. Nine of the patients died during the course of the observations, and their blood was examined post-mortem. Seven of them gave absolutely sterile blood, one case developed streptococci, and another developed streptococci with *Staphylococcus pyogenes aureus*. The author concludes that bacteremia in pulmonary tuberculosis is a very rare occurrence; streptococci may occasionally be found, but the finding of staphylococci *intra vitam* is to be regarded with scepticism. Where organisms are found in the blood after death, their entrance must have occurred in the agonal period. A postmortal entrance probably cannot occur, as is shown by the author's experiments. He, therefore, maintains that the fever of progressive pulmonary tuberculosis is not caused by a bacteremia, but the possibility of a toxemia cannot be denied. [B.K.]

The Cause of Pulsations in Empyema.—W. J. Calvert (American Journal of the Medical Sciences, November, 1905) says the requirements of pulsation are a firmly fixed pulsating organ; contact of the pleural wall with this pulsating organ; distention of the pleural sac with fluid, air, or solid material, and collapsed condition of the lung. The first is fulfilled by the thoracic aorta, the second by the normal relation of pleural wall to the thoracic aorta, the third by the presence of fluid, pus, or a combination of these with air in the pleural cavity, the fourth by the collapsed lung in pleurisy and empyema. In the normal thorax the pulsations of the aorta are absorbed by the easily compressible lung tissues, consequently are not transmitted. The impulse of the aorta transmitted to the pleural effusion will cause pulsation of the intercostal spaces. It follows from this that in pleural effusions pulsation is not a positive sign of pus. [A.G.E.]

Acute Pericarditis Complicating Acute Lobar Pneumonia.—J. A. Chatard (Johns Hopkins Hospital Bulletin, October, 1905) considers this a most serious complication, occurring more especially in young adults, frequently insidious, latent, and often not recognized during life. It appears to arise as frequently by a metastatic process as by direct extension. Treatment is very unsatisfactory and often unavailing, except when fluid is present, in which case it is more surgical than medical. A careful watch should be kept on the heart, as urgent treatment in the early stages may materially reduce a high mortality. [H.M.]

The Influenza Bacillus in Bronchiectasis.—T. R. Boggs (American Journal of the Medical Sciences, November, 1905) says with the exception of the investigations of Lord, the relationship of *B. influenza* to chronic pulmonary disease has received but little attention in this country. He presents notes of six cases studied in the Johns Hopkins Hospital and reaches these conclusions: (1) The influenza bacillus is probably capable of producing extensive pathologic changes in the lungs, leading at times to bronchiectasis. The organism may be a secondary invader or associated with other bacteria; the latter may be the preponderant factor. In our small series there was no clinical difference determinable between the pure influenza infections and the mixed noninfluenza cases. (2) The very close clinical resemblance of these cases of bronchiectasis to some cases of chronic tuberculosis with cavity formation is

important and may, in the absence of cultural investigations, lead to wrong diagnoses. Physical signs alone, therefore, cannot be relied upon for a positive diagnosis of tuberculosis. (3) Care should be taken to prevent the possible infection of others from these chronic cases having influenza bacilli in the sputum, as the organisms may not have lost their pathogenicity by a continued growth in these old infections. [A.G.E.]

Dangers of Forced Feeding in Tuberculosis.—F. Moulisset (Lyon Médical, Oct. 29, 1905) says forced feeding is adopted in tuberculosis for the purpose of having the patient put on flesh. But if the feeding be badly regulated, digestive disturbances and their consequences will offset the good effects otherwise gained. A rapid gain in weight is to be avoided, and a weekly gain of 250 gm. ($\frac{1}{2}$ lb.) should ordinarily be sufficient. Among the immediate dangers of forced feeding are hyperchlorhydria, hyperacidity from secondary fermentations, and dyspepsia. Diarrhea may be produced, when the intestines receive food from the stomach that is poorly prepared for digestion. A mucomembranous colitis is also among the possibilities, while a condition of autointoxication may produce the picture of neurasthenia. Albuminuria, hepatic disturbances, and cutaneous complications are also among the results of suralimentation. Among the more remote effects of forced feeding, the most serious is the production of pulmonary congestive crises, which may result in a diffuse bronchitis, asthma, hemoptysis, or the lighting up of old tuberculous lesions. In order to obtain the best results from feeding in tuberculosis, there should be regularity in the composition of the meals, the different dishes should be proportioned conveniently, and those articles of food should be chosen that give the greatest nourishment with the least bulk. The proteids and carbohydrates are of the most value. Eggs and milk in moderation are valuable, but a too great number of the former will overtax digestion, while large quantities of milk offer the disadvantage of too much liquid. Raw meat affords a very rich food, and may supplant cooked meat at times. In prescribing a diet for the tuberculous patient, the physician should examine the gastrointestinal tract as carefully as he does the lungs, and should adapt the food to the digestive powers of those organs. [B.K.]

Endocarditis in Tuberculosis.—H. T. Marshall (Johns Hopkins Hospital Bulletin, September, 1905) reviews the literature of the subject and reports the cases occurring in the pathologic and medical records of Johns Hopkins Hospital. From the review it is evident that it is not easy to prove that any given endocardial vegetation is produced by the tubercle bacillus, as this must be demonstrated not on the surface, but in the depth of the vegetation, and thus stained sections are of more value than cultures or inoculations, as the position in which the bacteria occur is more certainly determined by this method. The elastic tissue stain must be used to prove that the process is above the elastica, that is, in the endocardium, not the myocardium. Such complete proof has been furnished in a few cases, and some writers, particularly the French, hold that the endocarditis in tuberculosis is not due to the direct activity of the bacilli in the vegetation, but to a toxin elaborated by the bacilli elsewhere and carried by the circulation, producing a toxic endocarditis. It seems hardly probable that the vegetations arise from toxins alone. The bacilli in a vegetation may be missed for several reasons. A few may furnish a focus on which a large thrombus develops, and would be found only in serial sections. The bacteria may be of low vitality and die out in the vegetation, or they may die as the result of protective substances formed in the circulation, and they are in a favorable position for attack by phagocytes. The cases reported cover those of endocarditis preceding tuberculosis, miliary tuberculosis in the endocardium, and nontuberculous endocarditis in tuberculosis. [H.M.]

GYNECOLOGY AND OBSTETRICS.

WILMER KRUSEN

THE TREATMENT OF UTERINE RETRODISPLACEMENTS.

A DIGEST OF RECENT PUBLICATIONS.

BY

WILMER KRUSEN, M.D.

The treatment of uterine retrodisplacements may be divided into palliative and surgical. The palliative treatment consists of the use of tampons and pessaries. Hirst (Textbook of Diseases of Women, p. 279) considers that the reaction against the use of pessaries has gone too far; that in some cases the uterus may be maintained in a good position indefinitely by a pessary and the patient be made perfectly comfortable; and if the patient elects this method of treatment after a full knowledge of the facts and of the possibility of a permanent cure by operative treatment, she has a perfect right to choose her own course.

Ashton (Practice of Gynecology, 1905, p. 353) says that the use of a pessary may in some cases effect a symptomatic cure, but the displacement will recur as soon as the instrument is discarded; and it should, therefore, be employed only when the patient refuses operative measures. Pryor (Gynecology, 1903), in discussing the use of the pessary, says that in cases of incomplete retroposition, which are readily replaced and in which no laceration of the soft parts exists, a well-fitted pessary will relieve. A pessary should never be introduced when any inflammation of the adnexa exists or the uterus is fixed; and one should never be employed when the displacement is due to endometritis until the latter has been cured. He believes there is too great a tendency in the profession to perform operations for retrodisplacements without first employing less severe methods. Twenty years ago Vedeler published a review of 3,200 cases of retroflexion. At that time it was considered absolutely abnormal, while now it is considered only relatively so. It may exist without symptoms, although these are liable to develop at any time. In his most recent paper (Nordiskt medicinskt Archiv, xxxvii; Surgery, No. 4, [Journal of American Medical Association]) he says that he regards fixation of the uterus as contrary to the laws of anatomy and physiology. Pessary treatment conflicts with modern ideas of asepsis and infection. The diseased retroflexed uterus, he thinks, should be treated according to the same principles as the diseased anteverted organ. He found anteversion in 64% of 7,200 women, retroversion in 20%, retroflexion in 9%, and anteversion in 7%. He observed in 62 cases the spontaneous transformation of retroflexion into anteversion, without morbid changes in the uterus. McNaughton-Jones (British Gynecological Journal, May 1, 1904), in a paper before the British Gynecological Society, states that in all forms of displacement in which its employment is clearly indicated a pessary generally gives material relief. He briefly summarizes the pathologic conditions which contraindicate the use of any pessary as follows: 1. Dis-

placements which are associated with inflammatory states of the endometrium until such endometritis be cured. 2. Those which are complicated by adhesions, rendering restoration of the uterus to its normal position impracticable. 3. Those associated with adnexal tumors and inflammatory conditions of the ovaries and tubes. 4. Those complicated by other than adnexal tumors in the pouch of Douglas, such as enlarged, sensitive, and prolapsed ovary, cysts of the ovary or mesosalpinx, pus cysts of tube or ovary, ectopic sacs, pedunculate myomas, solid tumors of the ovary or fallopian tube. 5. All cases in which, after reasonable trial of a pessary and palliative treatment of the displacement, the prolonged use of a pessary is necessitated, inasmuch as without the latter the displacement recurs, and when, even with the pessary in situ, the uterus cannot be kept in the normal position. This summary practically represents the present status of gynecologic opinion in regard to this instrument, that it has a definite place when properly fitted as a palliative measure in the treatment of retrodisplacements.

The pessaries usually employed by American gynecologists are the various modifications of the Hodge pessary, which consists of a posterior bar, with converging side bars, which are united by a shorter bar anteriorly. Laterally, the pessary has the shape of the letter S. In its modifications by Thomas and Munde, the posterior bar is thickened, thus making a larger mass in the posterior vaginal fornix.

The tampon may be employed temporarily to maintain a retrodisplaced uterus in its proper position, or when medicaments are to be introduced. According to Montgomery (*Practical Gynecology*, 1908), the best tampon is composed of a combination of gauze and cotton or of lamb's wool.

In discussing the surgical treatment for these malpositions, one finds the decision is difficult as to the proper operation to select in the face of such contradictory statements from eminent operators. Statistics will prove anything. Good results have been obtained from many procedures, while bad results have attended all operations in the hands of unskilful operators. Careful discrimination and excellent surgical judgment are necessary in the selection of the operation best suited to the individual case. Lucy Waite (*Journal of American Medical Association*, Feb. 11, 1905) pertinently observes that "it is time to take more frequent and accurate inventories of our work with the view to discarding antiquated methods and retaining those which have proved successful and beneficial." At least 50 different methods have been proposed, several years of operating have passed, and the testimony in regard to these operations is now coming in, making such inventories practicable.

These operative procedures may be divided into four distinct classes: 1. Extraperitoneal methods of shortening the round ligaments. 2. Intraperitoneal methods of shortening the round ligaments. 3. The operations for abdominal suspension. 4. Operations through the vagina.

The old fear of the peritoneum formerly caused surgeons to avoid opening into the abdominal cavity; but the possibility of fixing the retroflexed uterus in such a

way that its fundus comes in contact with the anterior abdominal wall, gave rise, many years ago, to the idea of direct anterior fixation without laparotomy. According to Emmet, Marion Sims first conceived this idea in 1859 and constructed a special hollow needle to pass a silver suture with this object, but having one day begun the operation he had not the audacity to finish it. Caneva, more than 20 years afterward, proposed abdominal hysteropexy by piercing the serous membrane through a small exposed surface but does not seem to have performed it. But all such blind procedures as these have been abandoned since the present perfected operations of suspension have been developed. One of the first premeditated operations for the retrodisplacement of the uterus was performed by Koebele in 1869 who, in a difficult case of retroflexion which had caused symptoms of chronic intestinal obstruction, incised the abdominal wall, brought the uterus forward, removed a healthy ovary, and sutured the pedicle to the lower border of the wound.

According to Pozzi the plan of sustaining the uterus by shortening the round ligaments originated with Alquié, of Montpellier, France, while two English surgeons, Adams and Alexander, reinvented the operation and performed it about the same time. This operation, which has become classic under the name of Alexander, consists in shortening the round ligaments by pulling them out of the inguinal canal and after cutting off the surplus ligament, stitching the free ends into the external wound. There are a few modifications of this procedure worthy of mention. First, the bilingual operation suggested by Goldspohn (*Journal of American Medical Association*, Nov. 18, 1905), of Chicago, who performed a bilingual celiotomy using the Bassini hernia technic, enclosing the wounds with the anchorage of the round ligaments to Poupart's ligament. This operation permits of intraperitoneal investigation and manipulation and, according to Goldspohn, is supported by certain stern anatomic facts: 1. The round ligaments of the uterus are the only structures continuous with it that, as a part of it, are composed sufficiently of nonstriated muscular fiber to undergo growth with it during gestation, and also involution after labor. 2. The round ligaments taper from within outward, so much so that their uterine origins are at least six times as strong as they are at their extraperitoneal, but intraabdominal, portions, which compose their most vulnerable points. 3. These weaker parts that call for reinforcement or elimination, however, are readily accessible through the inguinal canals from without, and not advantageously from any abdominal or vaginal incision. While he advocates his own procedure, Goldspohn believes that the intramural transplantation of the round ligament is far preferable to those operations that shorten them by doubling up the thick and accessible ends of the structures, while leaving the outer feeble and inaccessible portions as weak and as liable to stretch as before.

Edebohl splits the entire length of the inguinal canals, draws the ligament out at the internal ring, and closes the wound as in the Bassini operation. Martin, of Chicago, and Duret, of Lille, do not use sutures, but pass a pair of dressing forceps beneath the skin and sub-

cutaneous tissue, from one wound to the other, draw the ligaments through, tie the two ends together in a knot, and close the tissues over the union. Martin considers this operation superior to all others because it insures a uniform shortening of the ligaments, with a permanent and strong fixation, without the necessity of placing any sutures, either temporary or permanent, thus eliminating the possibility of fistulous tracts being formed because of infected sutures.

On the other hand, the disadvantages that have been urged against the Alexander operation and its modifications are, that two incisions are necessary; that the procedure is limited in its application unless a free intraperitoneal incision is made over the weakened portion of the abdominal walls; that the round ligaments are so attenuated as to be of little use in maintaining the organ; and that in cases of infection the involved ligament may slip back and carry infection beneath the peritoneum.

The second class of operations are those for the intra-abdominal shortening of the round ligaments. In this operation the round ligaments are shortened within the peritoneal cavity by making a median incision. This permits the uterus and appendages to be examined and treated, if necessary; while existing adhesions can be broken up and the round ligaments shortened by folding them upon themselves, as suggested by Wylie, Ruggi, Bode, and Mann; or by suturing them in front of the uterus, as suggested by Polk and Dudley. Ries, of Chicago, cuts a slit through the anterior surface of the fundus, through which a loop of the round ligament is carried and sutured to a corresponding loop from the opposite side. Menge (Centralblatt für Gynäkologie, No. 24, 1904), of Leipzig, describes a method of ventral fixation which consists in stitching a sling, made by the intraperitoneal shortening of the round ligaments, to the abdominal wall at the level of the insertion of the ligaments into the uterus, using catgut only for the fixation sutures. Webster picks up a loop of the round ligament and carries it through the broad ligament beneath the oviduct and secures it to the posterior surface of the uterus. This procedure has been modified by Baldy, of Philadelphia, who ligates the uterine end of the round ligaments, incises them external to the ligatures, and carries the free ends, instead of the loops, through the broad ligaments and fastens them to the posterior surface of the uterus.

Of the operations recently described, one of the most important is that designated by its author, Gillam (Practical Gynecology, 1903), of Columbus, Ohio, as the round ligament ventrosuspension of the uterus. In this procedure the usual median incision is employed and a perforating forceps is passed obliquely through the fascia, muscle, and peritoneum of the abdominal wall, entering about half an inch from the edge of the incision and emerging on the peritoneum an inch from the edge of the incision. This forceps grasps a ligature which has been previously passed under the round ligament about an inch and a half from the uterus. The forceps is then withdrawn, bringing with it the thread and ligament which is sutured by a catgut suture to the fascia of the abdominal wall. According to Gillam, the prime requisites of an operative

device for retaining the uterus in normal position are, that it is one that will utilize the natural supports of the organ; that will insure a certain amount of mobility; that will adapt itself to the various functions of the uterus—pregnancy and parturition; that will be lasting in its results and withal easy of execution. This procedure seems to fulfil in a marked degree these requirements.

Abdominal Operations.—Suspension of the uterus, ventrofixation, gastrohysteropexy, gastrohysterorrhaphy, and gastrohysterosynaphy, are synonymous terms applied to a number of similar abdominal operations, all of which are employed with a view of permanently overcoming retrodeviations of the uterus by the formation of an artificial ligament, which holds the fundus in an anterior position. Olshausen (Zentralblatt für Gynäkologie, No. 43, 1886), of Berlin, was the first to publish a paper upon this subject, while a few months later Kelly (Operative Gynecology, 1898), of Baltimore, published his paper entitled "Hysterorrhaphy." This operation consists of an incision in the median line, through which the uterus is exposed, and the fundus sutured to the parietal peritoneum at the lower angle of the wound. This procedure has been extensively used by many operators for the radical cure of retrodisplacements of the uterus. Beyea (University of Penna. Medical Bulletin, Nov., 1904) reports a statistic study of 465 cases of ventrosuspension of the uterus, and states that it has always proved an efficient operation, has never been complicated, nor produced abnormal gestation, nor complicated labor. So far as he could ascertain, of 270 women from whom replies were received, 163 were married, and of these 41 had been pregnant since the operation. In none of the labors was there any complication that could be attributed to the operation. Weindler (Monatsschrift für Geb. und Gyn., June, 1905) sums up the results of the operations done by Leopold from 1896 to 1903, 51 cases, and gives the final result of all the cases that could be followed up and reexamined; and, from his studies, is satisfied that this is the best operation for the treatment of retroflexions of the uterus. Guerard (Monatsschrift für Geb. und Gyn., Bd. xix, S. 229), of Dusseldorf, is convinced that no interference with labor need be expected from either ventral or vaginal fixation properly carried out. In 57 labors after ventral fixation there was no difficulty in 51; forceps were applied in 5. The fixation had been made supplementary to other operations in 49 instances, and retroflexion had recurred in 2. In 41 labors after vaginal fixation there was no difficulty in delivery in 39; the low forceps were used in 4; nor was there any disturbance during pregnancy. Retroflexion recurred in one instance. The fixation was made with two silk threads inserted somewhat below the midpoint, between the insertions of the tubes and that of the peritoneum, and the stitches were removed after 14 days. There were 7 abortions after vaginal fixation. On the other hand, Milander, Bidone, Dorland, and many others have reported unusually severe and complicated labors following ventral suspension. Lynch collected a large number of cases of serious dystocia among them 21 cases of cesarean section and 10 of ruptures of the uterus.

The objections that have been advanced against the operation of ventrosuspension are: 1. That it substitutes a fixed, unnatural ante flexion for a retro flexion. 2. That the attachment of the fundus of the uterus to the abdominal wall behind the symphysis pubis must interfere with the natural distention of the bladder and so excite dysuria. 3. That in event of pregnancy after the operation, the patient's life may be endangered by the inability of the uterus to develop naturally. Kelly (*Operative Gynecology*, 1898), in reply to these objections, states that in the first place the actual fixation to the abdominal wall lasts but a short time, and that bands of adhesion soon form which permit of a certain degree of mobility of the uterus; second, that the irritability of the bladder usually is only temporary, as the female bladder usually expands physiologically like saddle-bags, from side to side, and least in the anteroposterior direction; third, that in a critical study of the effects of the operation upon subsequent pregnancy, made by Noble, it was found that all the serious effects had been met with in the cases having broad adhesions between the uterus and the abdominal wall. Undoubtedly, the method of fixation that is employed has much to do with the complications which have arisen during pregnancy and parturition.

Vaginal Operations.—One of the first vaginal procedures performed for the relief of retrodisplacement was that of Schucking, which consists in passing a curved instrument into the uterus from which a concealed needle was driven through the anterior vaginal fornix. This needle carried back a ligature which, when tied, fixed the uterus in a position of ante flexion. This operation has long since been wisely abandoned because of the danger to the bladder and intestine. The operation of vaginal fixation devised by Duhrssen consists in making a vertical incision through the anterior vaginal wall in front of the cervix, pushing the bladder off until the peritoneum is reached. Without opening into the peritoneal cavity, sutures are introduced, fastening the anterior wall of the uterus to the vagina. Mackenrodt modified this procedure by opening through the peritoneum and introducing the sutures at a higher level, thus securing the anterior wall to the vaginal incision. The operation of hysterocysterorrhaphy, or attachment of the uterus to the bladder, has also its advocates. This is done by opening the anterior culdesac per vaginam, denuding a small surface on the anterior wall of the uterus, and a corresponding surface on the posterior wall of the bladder, and uniting the two organs in this region by interrupted sutures. So many cases of dystocia have occurred after the operations of vaginal fixation that they have not found much favor among American gynecologists. Vineberg and Wertheim have devised operations for shortening the round ligaments through the anterior vaginal incision, while Freund and Gottschalk make a posterior colpotomy by a vertical incision and shorten the uterosacral ligaments. Pryor (*Gynecology*, 1903) advocated a transverse incision in the posterior vaginal fornix, through which he broke up adhesions, carried the uterus forward and packed gauze into the posterior culdesac; then with a tampon he pressed the cervix well upward and backward, the subsequent

adhesions of the cervix in this position leading to a correction of the malposition. The cervix becomes anchored in this high and backward position, and the intraabdominal pressure, acting upon the body of the uterus, forces it forward.

Space will not permit a further review of the literature upon these mooted points, but from a careful study it seems that the general trend is toward the abandonment, by American operators at least, of the vaginal procedures and the employment of the ventrosuspension procedure only in those cases in which subsequent pregnancy cannot possibly occur; that those operations on the round ligaments which utilize the inner and stronger parts for sustaining the organ are steadily growing in favor; that with our perfected technic and ability to treat adhesions and diseases of the appendages more readily, the median incision will supersede the biinguinal methods. Every gynecologist who devises a modification of a procedure naturally favors the child of his inventive genius, and sometimes overestimates its value; so that it is only by a calm and unbiased appreciation of the limitations of all these methods and the exercise of discriminating judgment that the best application may be made in the interest of the individual case. In conclusion, it is interesting to note that the pessary is not regarded as an antiquated and obsolete instrument, but that many of our practical and experienced gynecologists have found a definite place for it in the treatment of mobile and uncomplicated retrodisplacements.

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Cold air in tuberculosis is now being given the credit for the wonderful results in mountain resorts. It is almost an axiom that one winter in the Adirondacks, for instance, does as much good as two summers. Patients, both here and in Europe, are kept out doors all the year round, even when the thermometer drops to 30° or 40° F., below zero, and the cold air of itself seems to cure in a manner which nothing else can accomplish. In some sanatoriums forced feeding is not practised in the incipient stages as it is not as beneficial as a merely good, generous, animal diet, and though hyperalimentation is a positive necessity in later stages, particularly if any emaciation has occurred, it is not a means of treating the early cases which have not suffered loss of weight. Sunshine is not essential—excellent results may be obtained in climates where the sun is very rarely seen. Mere outdoor living seems to be the essential element, and yet there does not appear to be any doubt that quicker results are obtained in the cold season than in the summer.

The Method of Curative Action.—Much thought has been expended upon this phenomenon and several explanations have been offered, none of which is satisfactory. It has been suggested that as such cold air is condensed, a cubic inch of it contains more oxygen, but it is probably warmed and expanded long before it reaches the lungs, and the wonderful results in surgical tuberculosis, as reported by Prof. Halsted,¹ in which the lungs are not involved, would point to some other reason for the cure. There is, then, some other specific effect, probably acting in a reflex manner through the nervous system, possibly in the nature of toning up of all tissues. Figuratively speaking, the protoplasm is keyed up to a higher pitch and is more energetic in overcoming bacterial invasions. Certainly, cases cured under such conditions are not as lasting as those cured at sea-level in warmer air, and, indeed, the loss of tone on leaving the

mountains not infrequently brings on early relapses. Even advanced cases seem to be arrested by cold air, but progress under all other treatments. The matter is not only of great general interest, but, from its practical value, it should receive an early explanation.

The cold-air treatment for infantile pneumonia is discussed in a vigorous manner by Dr. W. P. Northrup,¹ Professor of Pediatrics of Bellevue. The method is such a startling change from the orthodox treatment of past generations, and yet so in line with recently acquired knowledge in other directions, that it is time for the profession of medicine to call a halt and overhaul its stock opinions. If the child's temperature is 105° F., it certainly is illogical to make it higher by hot chest poultices, heavy coverings, crib in a corner of the room, steam kettle boiling, gas leaking into room, and every breath of fresh air carefully excluded. Yet this is just the course instinctively followed by every mother, who always associates pneumonia with cold and its cure with heat. Northrup details two desperate cases treated upon the opposite plan, and though he leaves but little doubt as to the perfect reasonableness of it all, it is to be confessed that it will be difficult to make the average mother carry out the treatment. A room temperature which compels the attendants to wear overcoats and furs does seem harsh, but if the results are explained they should be no complaint. Cyanosis disappears, the blood reddens, restlessness diminishes, sleep comes on, the heart is stronger, the respiration is less labored, digestion is improved—and all from the cold air which bathes the little sufferer's face and enters its lungs. If such great good can be accomplished by this simple means, surely an effort should be made to induce mothers to carry out the method in all such cases.

The cold-air treatment in pneumonia of adults has also been tried with apparent benefit. It is said to

¹ *American Medicine*, Dec. 2, 1905.

¹ *New York Medical Record*, Feb. 18, 1905.

reduce cyanosis, lessen the rate of respiration and pulse, steady the heart, lessen fever, and reduce the discomfort and pain. It also seems logical to keep the patient cool all the time, instead of reducing his temperature only periodically by sponge baths, or even tubbing. In northern winters the windows have been kept open in the sick room even when the thermometer was much below the freezing-point. The patients promptly complain if the windows are closed and the air becomes warm and stuffy. It is not mere fresh air and ventilation, but the coldness which is appreciated. Taken with the results of similar treatment in tuberculous infection, it seems that there is some special benefit derived from cold air in all pulmonary infections. Pneumonia is said to be very rare, or even unknown, in the Arctics, and yet Eskimos perish of this disease when brought south. In the cold parts of the northwest, pneumonia rarely appears in the bitterly cold winter months, but is more a disease of spring, and even summer. Dr. Charles E. Page,¹ of Boston, not only emphasizes the necessity of cold, fresh air in pneumonia, but also the benefit of cold applications to the chest—constant cold, not periodical. He has many caustic things to say of the opposite methods which appear to increase the dangerous symptoms. Perhaps we can detect a growing tendency to keep all fever patients in cold air whenever practicable. The Japanese seem to obtain good results by this method, for their hospital wards in cold weather are kept at a low temperature, which would be considered brutal with us.

Cold air for typhoid and all other infections is but a step further—not cool air but cold. If all these new ideas are to be carried out to their legitimate conclusion, it is surely proper to immerse every patient in his normal cold atmosphere and not a tropic one. He can be properly covered, even if he is breathing air freezing cold, but to make him breathe hot air seems as illogical as to place trout in warm water. The Brand method of cooling typhoid patients is known to save several in every hundred, and its remarkably beneficial effect on the nervous system is said to be the main reason. A walk through a typhoid ward where cold baths are given, reveals so many bright, intelligent faces—so different from the stupor of typhoid curing itself—that one almost thinks it is a different disease. It seems to have the same tonic effect as cold in surgical tuberculosis, but it is in order to inquire why the patient cannot be kept in cold air to continue the effect, properly covered, of course, so that it merely bathes his face and head and upper air passages. Perhaps the cold air of mountainous

regions is the reason why typhoid takes such a mild course that it was actually considered a different disease for so long a time. The whole matter is worth considering in every other infection, if with no other therapeutic view than with the mere idea of placing the patient in the normal European atmosphere known to be good for his ancestors.

Cold Air for Healthy People.—The thought is naturally suggested that perhaps cold air has hygienic as well as therapeutic uses. Warm sleeping rooms are strictly modern inventions, and pneumonia as a serious menace to life is also a comparatively recent affair. It is time, then, to inquire if our over-warmed houses have any relation to the appalling increase in pneumonia. Does not this continual tropic house warmth actually reduce the tone of the tissues and make them more susceptible to bacterial invasion? Foreigners bitterly complain of the heat of our houses, and Americans abroad have equal objections to the coldness of foreign houses—keenly suffering in a Parisian hotel for instance, which is perfectly comfortable to the native. In Japan it is the same, Americans apparently being unable to live in the paper houses of the natives, who are comfortable even when huddled around a few coals of fire. Perhaps the types of men in northern Europe, through ages of exposure to cold, have actually developed a physique which is not only inured to cold, but actually functions better in cold air than in hot. They surely are healthy and strong now, and do not suffer in the least from the cold. We rather look upon hot weather as relaxing and destructive of vitality, and expect health with return of cold weather. Brook trout perish if the water they breathe is raised only a few degrees in temperature. There is enough in this matter to cause us to think about it a little. If so many cured tuberculous patients are now sleeping in cold air every night and living in it in the daytime, too, as much as possible, perhaps the rest of us are only injuring ourselves by the opposite course. Only a few years ago the cold-air fiend, who slept with windows wide open in the coldest winter, was considered a crank. Perhaps he will prove to have been the only sensible one among us, and was merely imitating the ways of his ancestors who had practically no way of warming their houses.

Osteopathy is defined and described in the *New York Independent*, November 9, 1905, by its originator, A. T. Still, of Kirksville, Mo., who explains, at first hand, many things of considerable interest to the medical profession. This peculiar medical cult has existed about 25 years, and was apparently doomed to death by

¹ New York Medical Journal, December 23, 1905.

inanimation when it took on renewed life about 10 years ago, and has shown such phenomenal growth since then that it is the part of wisdom to examine into the reasons for its existence. From his own statements, it is evident that Still began his work by one of those curious bits of illogic "reasoning" which make up so much of the history of the world—which, indeed, have always had a tremendous influence upon the course of events—from the burning of witches to the vagaries of Mohammedan fanatics. He knew that the life of cells was dependent, among other things, upon the foods brought to them by the blood. This one true idea then became dominant and overpowered all others, and as soon as such a mental attitude was gained, the other steps were easy. There could be no other condition which kept cells alive, and deprivation of blood was the only cause of cell death—excessive heat, deprivation of heat, corrosives, toxins, traumatism, interference with nerve-supply, and all the thousand and one things which can cause death, were either forgotten entirely or were considered to be merely remote causes of obstruction of the circulation, or followed it. Then came the conclusion, "an unobstructed, healthy flow of arterial blood is life"—a definition which is phenomenal among all the thousands of attempts to define life—phenomenal, in that it proceeds from as clear an obsession as it is possible for psychology to furnish.

The obsession in osteopathy thus became the center around which all subsequent thoughts arranged themselves in the effort to explain pathology on one principle. For instance, disease must be partial death due to partial blood obstruction. The mind then sought for mechanical causes of the obstruction, and the explanation hit upon involved the usual mental gymnastics familiar to all students of psychology—that is, it was not due directly to pressure on the vessels at all, but pressure upon the spinal nerves as they passed through the foramina of the spinal column. A slip or "dislocation" (now called subluxation) of a vertebra caused a pressure upon the bloodvessels supplying the cord, and also pressed upon the nerves carrying "all the vital impulses between the cord and the viscera"—that is, the blood is no longer life, but the cord is; the vital impulses travel through the nerves and not in the blood. Tissues are not diseased by interference with their blood supply, but by interference with the vital impulses in the nerves. Life is now considered as something which passes out of the cord through the foramina—"through them went life." The next step was inevitable—"at these foramina we find the seat of 95% or more of the lesions"—that is, these are mere mechanical causes of all diseases except the 5% due to unknown or unmen-

tioned causes. The pressure is thus trebly effective—it deprives the cord of part of its life through pressure on its bloodvessels; this diminished life is further dammed back by pressure on the spinal nerves through which it flows, but how this affects the blood supply of the diseased organs is not explained. The name osteopathy is thus to emphasize the theory that bone pressure causes all diseases.

The spread of osteopathy is the thing to discuss, as it is quite evident that the illogic and bizarre theory cannot be seriously considered, particularly as it states that postmortem examinations reveal the pressures and that relief of the pressure is curative. The matter is merely one of the thousands of illogic baseless theories recorded in the history of medicine; it is the dogmatism which has always afflicted every science. The textbooks written by osteopaths are so full of unproved and unprovable assertions that any discussion of them is not possible. It is really pathetic in this age, but why does it not die? One reason for the success of the cult is no doubt due to the fact that the massage and joint movements are really beneficial, or perhaps even curative, in a certain percentage of chronic invalids who no doubt constitute the majority of its devotees. Suggestion also is probably responsible for improvement in the neurotic cases which flock to every new fad. Even frauds may have great success temporarily, but so far as known there is not the slightest hint of fraud in the origin of this curious dogma. The main reason for the spread of the delusion involves the same illogic conduct characteristic of it all. The textbooks truly assert that no one can practise their methods unless he is thoroughly grounded in anatomy, physiology, and pathologic histology, to which we must add physics, chemistry, psychology, and all the branches of a liberal medical education, matters of several years of instruction. Nevertheless the graduates are turned out without the very instruction which is claimed to be essential. Hence, ignorant men, wholly lacking the first essentials for the practice of osteopathy, are given diplomas certifying that they are competent.

The death of osteopathy can be safely predicted, and there is nothing to worry about. It will cure itself, for no system can stand if its professors are so ignorant. If they become learned they will not be osteopaths. No doubt many of them have been duped into taking up the alleged study and will drop it in time as they learn better; those who cannot make a living at it will, of course, drop out, and the quacks who see in it a new field will work it as long as money can be squeezed out of a gullible public in this easy way. The licensing of osteopaths should not worry the public nor the regular

medical profession. If they can pass an examination in the things which they declare essential to a knowledge of the cult, we should not object; and the public must insist upon such knowledge to prevent injurious massage by ignorant pretenders. No man will spend the time necessary for such learning and not be convinced that he must know more. So it is proper for our legislators to insist upon these men passing a regular examination, and when once that is demanded, the delusion will fade and finally disappear to join the hosts of departed fads. It will last some years yet, probably many years, but all the people can't be fooled all the time. The pathetic side of the origin of the delusion is the part of the matter which has been so strangely overlooked. As a subject for psychologic study, it is of considerable scientific interest. A systematized delusion is defended in just the way this theory is explained.

The lessons to be learned from osteopathy are quite evident, and are the same old lessons learned from every other similar movement. Of course there is the chance for ignorant but honest men to attempt medical practice after a few months' training—a very old story; nor is there anything new to be learned from the creation of a new field for quacks. The potentialities for harm in these two classes are so great and so well known that it is really a waste of time to refer to them. Public safety demands that men permitted to treat any diseases must be learned men, at least learned in the parts they need—anatomy and all the other basic branches. Nor is there anything to be learned from the fact that this new fad offers a field for the use of suggestion in neurotic complaints—every bold assurance of cure does that. A learned London physician has even shown that there are great therapeutic benefits in prayer in calming hypersensitive nerves and diminishing mental irritability. It is the reason why certain emotional religions, as distinguished from the cold reasoning ones, are so much more popular and beneficial to the nervous and emotional parts of the community. The real lesson from osteopathy, which the medical profession must learn, is the fact that massage and passive movements have a much wider field of usefulness than is generally supposed. It is a therapeutic measure often sadly neglected by the intellectual doctor who will prescribe a drug, but is not a mechanic in any sense of the word. Such manual labor should not be impractical, though it apparently is. The average patient cannot afford a masseur and doctor, too, when he needs both. If the osteopath will confine his mechanical labors to the direction dictated by a learned physician, he might be of benefit indeed, but if he is to assure the public that 95% of all diseases are thus cured, he is a menace to public safety. There can be no com-

promise on that point, but it can never be an excuse for persecution of men, many of whom are honest, though fanatically deluded. Making martyrs of them will only perpetuate an illogic fad, which is sure to die of inanition in time.

A problem in practical ethics is before the local profession probably of every city in the United States, and in the larger cities it is multiplied a number of times. Let us take one definite example as a type: Before his sins—at least before his fellow practitioners have "found him out" a man gets into the local medical societies and establishes a fair reputation and practice. Soon are told stories, both by patients and by physicians, and dark hints, or sorry evidences of trickery appear about the man. It is found that he is playing all sorts of fraudulent games with his patients to make money; he demands visits not medically required so long as the patience of the patient, and his pocket-book will endure it. He smuggles in an unnecessary operation or two. If the bill is not paid there is a legal suit or a threat of it, until the poor dupe settles as best he or she may, usually paying in full to avoid trouble and to be done with the sharper. Expensive medicines of a peculiar character, or even instruments have perhaps also been ordered. There has been little or no cure of the disease, and when possible, there has been only an imagined, or encouraged, sometimes even a diabolically created disease present. The scamp intimidates his patients, gets new ones, heaven knows how, and while growing from bad to worse, covers up his deviltries so dextrously that legal proof of unprofessionalism cannot be got. His ways become known to censors and colleagues; each shrinks from the danger and the odium of exposing him, and so the infamy goes on. The local and the general professional reputation suffers, and the good name of medicine is degraded, while disgusted patients go over to quackery, saying, "These doctors must be much alike, or they'd run such fellows out of their medical societies, or 'show them up' in some way." We invite our subscribers to say what they would advise in such cases.

Gumption is so rare that any book on the subject should be rare reading, and so it is. Would we had more of it and of them. It makes the mare go even more than money, for gumption brings the money, and that makes her go anyway. It is merely common sense, of course, but that is uncommon sense after all. So it is good to read of men with gumption, and Mr. Nathaniel C. Fowler has described quite a few of them in his delightful novel,¹ telling of quite a few gumps beside.

¹ Gumption: Small, Manard & Co., Boston.

As a bait, he starts out with a character sketch of the old style country doctor so chockful of gumption that it just simply oozes out at every pore. "Day by day he pilgrimaged to the outlying towns, curing as he went"—and did it all with castor-oil. Babies didn't cry for castoria in those days—and don't yet. After being hooked good and fast by the first chapter a physician is compelled to swallow the whole book, he can't get away from it. The young physician just starting out ought to know a little more than he learns in his lectures; if he has gumption he will learn it anyhow, but the chances are he hasn't got it and should read "Gumption" to learn that in dealing with sick men the personal equation of the invalid is the thing to study. It is really as important to know "what kind of man the disease has got as to know what kind of disease the man has got," so that what seems to be trickery is merely winning confidence, upon which many an invalid starts to recover at once. It's the kiss on the baby's bruise—satisfying and curative. After all, most of us only want a little sympathy when we are sick, and, like big babies, we pine if we don't get it. Patients pay well for it, and the successful doctor dispenses it with his drugs, while the learned fool, who hasn't any sympathy to spare, is a flat failure, though his treatment in other ways may be therapeutic perfection.

City parks are the subject of an extensive report of the Philadelphia Allied Organizations, in which are described and mapped the existing and proposed parks and driveways in numerous American cities. There is probably no modern movement more conducive to public health than the widespread desire of city people for more breathing room. Man is not a city animal at all; he was evolved in the country with unlimited fresh air and pure water. The city environment is so unnatural and so destructive of vitality that few families survive it many generations. The adults are not harmed so much as the children, so that it is quite common to see a country bred man live to old age in the city and witness the death of most of his children, and if they do survive, their children are apt to be still more frail. London thus receives and has always received a stream of country immigrants who melt away. Anthropologists assert, therefore, that cities are consumers of population. Until the present century there were only two or three big cities in the world, but with the wonderful development of manufactures following the perfection of the steam engine, the people were compelled to leave the little villages where each house was a little factory and bunch together in factory towns. New methods of preserving and transporting foods also made this possible. Hence we saw the wonderful town

growth of the last 70 years, European cities outstripping us in spite of our boasts. The process was so rapid that houses were crowded together and an environment created in which no family can long survive.

Modern rapid transit dissolved the greater part of the evil like magic. Men, who a quarter century ago could not leave the city, can now live in the country and come in every day. Children are being raised under ideal conditions, and the city man is nearly as well off as his grandfather was in the country village. Yet there are millions left behind in the cities and among them the deterioration continues. The present tendency all over the world seems to be in the direction of tearing down a block of houses here and there and creating local parks and playgrounds to get the children outdoors, where they belong and yet not in the streets, breathing germ-laden dust. By all means let this movement continue until all cities are so spread out as to resemble our ancient green villages, with plenty of breathing room and no dust. The majority of Americans must live in cities, and it is high time they make conditions so natural that we will no longer confess that cities are consumers of population. Even the business portion of our cities can be improved. In summer they are now like huge cauldrons boiling the bodies of the poor victims of the rush for gold. In the residence portions the matter is positively vital—lawns, shade trees, dustless streets, no glare in summer, pure air and plenty of it, and the babies out rolling in the grass.

Doping the Immigrant.—Immigration officers state that there is an extensive business in doctoring immigrants so that, while really unfit, they can pass the physical examination at Ellis Island, says the *Philadelphia Press*. When past the barrier, they are at liberty to relapse, and do so promptly. In many foreign cities there are hospitals for the treatment of people anxious to enter the United States. Especial attention is given to trachoma, an eye disease much dreaded here. One conscienceless Frenchman has made a fortune by this, largely through treating for the malady people who never had a touch of it. As these pass the examination, as a matter of course, they constitute a fine advertisement for the charlatan. Those really affected get temporary relief, the telltale symptoms abating long enough to serve the purpose. The idea is new only in this particular application. Horse traders resort to similar methods. Some of them can so doctor a decrepit animal that for the nonce he is spirited, his coat shines, and he has a pleasing plumpness. Soon after a sale he collapses like a balloon. Horses are doped just before a race, and run with an artificial speed and strength, but the method fails to win approval. The immigrant that cannot pass muster until he has been doped should not be admitted. The possibility of his attempting it demonstrates the necessity for more rigid inspection. He makes essential a longer period of detention, and it may become imperative to analyze him for traces of adrenalin. The importation of healthy immigrants is desired, but infectious maladies must be kept under the ban, even to the discomfiture of the doped alien.

BOOK REVIEWS

Krankheiten und Ehe.—Darstellung der Beziehungen zwischen Gesundheits-Störungen und Ehegemeinschaft, II und III, Teile. Herausgegeben von Prof. Dr. H. SENATOR und Dr. med. S. KAMINER. Rebman Company, New York.

This work, of which the first part has previously appeared in German, and which will soon be published in the form of an authorized English translation, is made up of a number of subsections, each of which deals with the diseases of a special organ and their relation to marriage. Each section is written by the most eminent German authority on the subject of which it treats. The writer takes up every disease separately and discusses its relation to the sexual life of both man and woman, also the influence of marriage on the course of the disease, the advisability of contracting marriage, the effect on possible offspring, and other questions of a highly important nature. Senator himself contributes the first section of Part II, a section devoted to constitutional diseases—diabetes, gout, obesity, etc. H. Rosin discusses diseases of the blood, paying special attention to the hereditary aspect of hemophilia. On account of the wellknown peculiarities in the transmission of this condition, he denies the privilege of marriage to all female members of hemophilic families, but allows the males to marry, whether or not they themselves are bleeders. E. von Leyden and W. Wolff write on the diseases of the circulatory apparatus and point out the dangers of pregnancy to a woman suffering from heart disease. The next section, on respiratory diseases, is taken up largely with the tuberculosis question, which is ably discussed by S. Kaminer. So far as the influence of marriage on the course of the disease is concerned, the regular habits of wedded life are apt to have a favorable effect in the case of the man, but pregnancy is always a source of great danger in the tuberculous woman. The questions of contagion and heredity in relation to tuberculosis are thoroughly discussed. The author recommends a probation period of at least three years after apparent cure before marriage should be allowed in a tuberculous subject. The chapters on diseases of the digestive tract by C. A. Ewald, and on the kidneys by P. F. Richter are concerned chiefly with a consideration of the effects of pregnancy on these organs, both in a normal and in diseased conditions. In the section on diseases of the skeletal system, A. Hoffa pays special attention to the relation of pelvic and spinal deformities to pregnancy and labor. R. Ledermann contributes the chapter on syphilis, and advises marriage only after the lapse of at least five years from the time of infection, provided no symptoms have appeared for two years, and a thorough mercurial cure has been undergone. To the discoverer of the gonococcus naturally falls that most important chapter on the relation of gonorrhea to marriage. In cases of chronic urethral discharge, where the presence or absence of the specific organism is in doubt, Neisser recommends that an acute inflammation be induced by mechanical and chemic irritation. By the method which he describes, not only are latent gonococci brought to light, but a favorable influence is also exerted on the chronic inflammatory process. It is only by most careful examinations and thorough treatment in every case of gonorrhea that disastrous marital consequences can be avoided. The sections on the male genitourinary tract and the female organs are placed in the competent hands of C. Posner and L. Blumreich, respectively. A. Eulenburg has written a most interesting, entertaining, and instructive chapter on the relation of nervous diseases to marriage. Sexual perversion is discussed by A. Moll, who cautions against advising marriage as a cure in such cases. A. and F. Leffmann contribute the chapters on alcoholism, morphinism, and occupational diseases in their relation to marriage. They advise

strongly against the marriage of alcoholics, and even believe that the State should interfere and forbid the banns, calling special attention to the effects of alcoholism on offspring. In a valuable section S. Placzek advises caution in the matter of professional secrecy where the physician knows that a candidate is unfitted physically for marriage. In the concluding chapter R. Eberstadt discusses marriage and disease from the moral, sociologic, and economic points of view. The demand for a higher moral code in women than in men is explained by the fact that nature has provided that a child shall know its own mother, but right and ethics must provide that it knows its own father. It is thus evident that the editors have collected a series of valuable articles on a subject to which far too little attention has previously been paid. We hope that the publication of this work, with its translation, will lead to a broader dissemination of its truths among the medical profession and a wider application of its advice in the choice of the parents of our children.

A Textbook of Practical Therapeutics.—By HOBART AMORY HARE, M.D., B.Sc. Philadelphia: Lea Brothers & Co., 1905.

This wellknown book has been revised to conform to the new United States Pharmacopeia and to enable comparison to be made with the British Pharmacopeia. Otherwise, it retains the features which have characterized it through every other edition.

The Microtometist's Vade-Mecum.—By ARTHUR BOLLES LEE. Sixth edition. Philadelphia: P. Blakiston's Son & Co., 1905.

But little need be said regarding this edition of Lee's work except that laboratory workers are pleased to see the somewhat delayed revision. The book is in a class by itself, both as regards references to the statements of other writers and the personal comments of the author; the latter are particularly incisive. The index contains 300 new subjects, but the book has been kept to its original size by severe condensations. It will continue to be the last court of resort in the subjects treated. The accuracy of the formulas is generally above reproach, but one error has been continued from the previous edition. In the formula for Toison's solution, page 386, the quantity of methyl violet is given as 0.25 gm. instead of 0.025 gm. Personally, we use more than the latter amount, but the former is entirely too much.

BOOKS RECEIVED.

[Prompt acknowledgment of books received will be made in this column, and from time to time critical reviews will be made of those of interest to our readers.]

Clinical Obstetrics.—By ROBERT JARDINE, M.D. (Edin., M.R.C.S. Eng., F.F.P. and S. Glas., F.R.S. Edin.), Professor of Midwifery in St. Mungo's College, Glasgow, etc. With 96 illustrations and a colored plate. Second edition. Rebman Company, New York, 1905. Price, \$4.75.

Lectures on Clinical Psychiatry.—By Dr. EMIL KRAEPELIN, Professor of Psychiatry in the University of Munich. Authorized translation from the second German edition. Revised and edited by THOMAS JOHNSTONE, M.D., Edin., M.R.C.P. Lond., Member of the Medico-Psychological Association of Great Britain and Ireland. Second edition. William Wood & Co., New York, 1906.

A Compend of Medical Chemistry.—Inorganic and Organic including Urinary Analysis.—By HENRY LEFFMANN, A.M., M.D., Professor of Chemistry in the Woman's Medical College of Pennsylvania and the Wagner Free Institute of Science. Fifth edition, revised. P. Blakiston's Son & Co., Philadelphia, 1905.

Transactions of the Association of American Physicians.—Twentieth Session held at Washington, D. C., May 16 and 17, 1905. Volume xx. Printed for the Association, Philadelphia, 1905.

Gallstones and Their Surgical Treatment.—By B. G. A. MOYNTAN, M.S. (London), F.R.C.S., Senior Assistant Surgeon to Leeds General Infirmary, Leeds, England. Second edition, revised and enlarged. Octavo of 458 pages, beautifully illustrated. Philadelphia and London: W. B. Saunders & Co., 1905. Cloth, \$5.00 net; half morocco, \$6.00 net.

AMERICAN NEWS AND NOTES

GENERAL.

Opponents of Pure Food Bill.—J. A. Yerington, of Chicago, chairman of the Board of Directors of the National Food Manufacturers' Association, is in Washington to appear before the committees of Congress to advocate the views of the association on food legislation. He says the association is opposed to the Heyburn bill, and will urge that the manufacturer be held responsible for the character of the goods shipped by him only while those goods remain in the original unbroken package in the form packed by him for shipment, and only while the article relates to interstate commerce and is subject to the provisions of a national law.

Joint Medical Board.—President has appointed a joint board composed of officers of the medical department of the Army and Navy to consider improvements in the matter of first-aid dressings and the advisability of the adoption of a uniform equipment in the medical department of the two principal branches of the military service. The members on the part of the Army are Colonel Valery Havard, assistant surgeon, medical observer with the Russian army, now stationed at Governor's Island, N. Y.; Captain Charles Lynch, general staff, the medical officer with the Japanese army, now stationed in Washington, and Captain Carl R. Darnall, who is in charge of the field medical supply department in Washington. The representatives of the Navy on the board are Medical Director J. C. Wise, commanding the naval medical school in Washington; Surgeon C. F. Stokes, professor of surgery at the naval medical school, and Surgeon W. C. Braisted, the naval medical observer with the Japanese forces. The main purpose in the appointment of this joint board is to take advantage of the observations of the United States military observers during the recent war between Japan and Russia, with a view to the adoption in the United States military service of improved methods of using first-aid dressings in the cases of men wounded by either land or naval engagements.

Personal.—Dr. R. Burton-Opitz, adjunct professor of physiology at Columbia University, who has for some years been the American editor of the *Biochemische Centralblatt*, has also become American editor of the *Bio-physikalische Centralblatt* and of the *Hygienische Centralblatt*.—Prof. Schweninger, famous as Bismarck's body physician, has resigned as head of the famous infirmary near Berlin, and will devote the evening of his life to private practice chiefly among the poor and destitute.—Dr. Koch has been placed at the head of an expedition to eastern Africa to investigate the sleeping-sickness, for which the German government has appropriated \$30,000.—Dr. Thomas F. Richardson, of the Marine-Hospital Service, has been designated by its chief, Dr. Wyman, to go to Honduras at a salary of \$7,500 a year from that country, to act as its health officer. Dr. Richardson was chief assistant to the surgeon in charge during last summer's fight against yellow fever at New Orleans.—The General Hospital Board of Virginia, composed of the directors of the different State hospitals for the insane, has appointed Dr. William F. Drewry superintendent of the Western State Hospital, at Staunton, to fill the vacancy caused by the death of Dr. Benjamin Blackford.—Baron K. Takaki, Surgeon-General of the Imperial Japanese Navy, has arrived on the *Siberia*, to deliver a series of lectures on "Military Sanitation" at Columbia University and at Jefferson Medical College, in Philadelphia. He will meet his son in Philadelphia, where the young man has been studying finance and commerce at the University of Pennsylvania. Baron Takaki is distinguished because of his discovery 22 years ago of means for preventing beriberi,

a disease previously quite common in Japan, but which has never since seriously affected the men in the navy.

NEW YORK AND VICINITY.

Dog Carried Scarlet Fever.—The young son of James Byrne, official sealer of weights and measures at Orange, N. J., died of scarlet fever contracted from playing with his dog, which had strayed into a house where several children were ill with the disease.

The Cartwright Lectures of the Alumni Association of the College of Physicians and Surgeons of New York will be given on January 25, January 29, and February 2, by Baron Takaki, on "Military and Naval Sanitation; Experiences Drawn From the Late Japan-Russia War." Dr. Takaki belongs to one of the Samurai families of the Satsuma Clan, as do his contemporaries, Generals Oyama, Kurobi, Nogri, and Nodzu, and Admirals Togo and Kammura. During his youth he was sent by his government to study medicine in England, where he graduated with honor from St. Thomas' Hospital School, studied the sanitary system of the British Navy, and passed examinations for the degrees of F.F.C.S. and F.R.C.P. On his return to his native country he directed his chief attention to the reformation of the sanitary and medical systems of the newly-born navy of Japan. It was not only reorganization that he accomplished, but the creation of an entire medical equipment and medical sanitary service for the Japanese Navy. He was rapidly promoted to the rank of Surgeon-General of the navy, which position he held until the time of the Japan-China war. As a recognition of his great services rendered to the Emperor and his country, he was created a baron after the conclusion of that war. At present he is in the Naval Reserve. During his active service in the navy Baron Takaki initiated and carried out certain fundamental changes in the dietary and sanitary regulation of the navy, which resulted in the almost total suppression of beriberi, which, up to that time, had seriously impaired the efficiency of the service, affecting annually almost a quarter of the navy's personnel. Baron Takaki has also been president of the Naval Academy of Japan, president of the Tokyo Charity Hospital, councillor of the Association of Sanitary Improvement of Japan, and has held other important positions. He has been active in spreading the principles of the Red Cross Society in Japan and it is to his efforts that the large number of Red Cross members in that country is chiefly due. Baron Takaki has received the honorary degree of Doctor of Medicine of the Japanese Government, a degree issued only by the Department of Education, and not the same as the degree of M.D. conferred on the graduates of the university. He is a member of the House of Peers of the Parliament of Japan, having been directly nominated by the Emperor.

PHILADELPHIA, PENNSYLVANIA, ETC.

Veterinarians Want State Board.—The Veterinary Medical Association of New Jersey, at its annual meeting, urged that a bill be framed and sent to the Legislature providing for the appointment of a State Veterinary Board of Health. It was asserted that a veterinarian is better qualified to decide what should be done with diseased animals than a medical doctor. Committees will be appointed to consider this proposition further.

Measles Increasing.—Measles has become epidemic in the West Philadelphia wards, and additional instructions have been issued by the health authorities cautioning parents to isolate cases of the disease. The spread of the disease is attributed by Dr. A. C. Abbott, chief of the Health Bureau, largely to the fact that parents neglect to summon a physician to treat their children. There are many cases of diphtheria in Philadelphia, which the authorities believe are due to the failure of physicians to use antitoxin.

Typhoid Fever in Wilksburg.—An epidemic of typhoid fever prevails in the borough of Wilksburg, adjacent to Pittsburg. There are now more than 100 cases of the disease and a number of deaths have resulted. A determined effort has been made by the Board of Health to find the source of contagion, but the investigation has completely failed. Samples of water taken from public springs have been brought to Pittsburg for analysis.

College of Physicians, at its annual election, chose these officers: President, Dr. Arthur V. Meigs; vice-president, Dr. James Tyson; censors, Drs. Richard A. Cleemann, S. Weir Mitchell, Horace Y. Evans, and Louis Starr; secretary, Dr. Thomas R. Neilson; treasurer, Dr. Richard H. Harte; honorary librarian, Dr. Frederick P. Henry; councillors, Drs. J. Allison Scott and Francis R. Packard; Committee of Publication, Drs. G. G. Davis, Thompson S. Westcott, and William Zentmayer; Library Committee, Drs. George C. Harlan, F. X. Dercum, Charles A. Oliver, William J. Taylor, and S. Weir Mitchell.

Typhoid Fever Increasing.—Continued increase in the number of typhoid fever cases is attributed by the health authorities to the condition of the city's water supply and especially to the neglect of householders to heed the warning to boil all drinking water. There were 267 new cases reported last week, as compared with 197 the previous week, an increase of 70. Of the whole number of new cases, 75 occurred in five wards in the northeast district of the city, which are supplied with water from the Delaware river, and 20 cases in West Philadelphia, which is supplied with a mixture of filtered and unfiltered water. The returns of contagious diseases show that there were 416 cases and 40 deaths last week, as compared with 341 cases and 36 deaths the previous week.

New Rules for Burials.—Owing to the fact that cemetery sites have been selected without regard to the geological formation, many of which are not suited for the purpose of properly protecting the health of the persons in their respective localities, the State Department of Health has decided to adopt the following rule and regulation: "Except by special permission from the Department of Health, no interment of any human body shall be made in any public or private burial ground unless the distance from the top of the box containing the coffin or casket be at least five feet from the natural surface of the ground, except where solid rock or water may be encountered. Then the distance from the top of the box containing the coffin or casket shall be not less than four feet from the natural surface of the ground; and with the further exception that stillborn children and children less than 4 years of age, dead of any diseases other than anthrax, cholera, diphtheria, leprosy, smallpox, scarlet fever, tetanus, typhoid fever, typhus fever or yellow fever, shall be buried at such a depth that the top of the box containing the coffin or casket be not less than three and one-half feet from the natural surface of the ground."

SOUTHERN STATES.

Mosquito Ordinance Amendment.—Dr. Kohnke, the New Orleans Health Officer, will talk on the petition of a number of gardeners, truck farmers, and florists in the city, who are seeking an amendment of the mosquito ordinance so as to secure the omission of the word "well" before the petition is finally acted upon by the committee. It has been stated that Dr. Kohnke does not object to the amendment being made as asked. The petitioners argue that open wells are breeding places for small fish, called minnows, who thrive on the larvae of mosquitos. If these wells are closed, they contend, the water will become stagnant and brackish and unfit for use. The screening of an open well, petitioners state,

would entail a hardship by subjecting them to unnecessary expense in the operation of their business.

WESTERN STATES.

Anticigaret Bill in Ohio.—A bill framed after the Indiana law to forbid the sale of cigarettes will be introduced in the Ohio legislature.

War on Tuberculosis.—Action has been taken by the Chicago school management committee which makes it possible that any child afflicted with tuberculosis can be taken from the schools. When a case of tuberculosis is suspected the principal must report it to the superintendent of schools. After the parents of the child are notified the pupil will be examined by medical inspectors of the child study department. The parents will be allowed to have their family physician present if they so desire.

Chicago's Low Deathrate.—December, 1905, was one of the driest months on record, according to the weekly bulletin of the Chicago Health Department. The total precipitation for that month was .68 of an inch, the average of 35 years being 2.05 in. Prof. Cox's report to the city shows that the mean temperature was 2.7° higher than the normal, and that only 10 previous Decembers had a higher mean temperature. These conditions undoubtedly have had much to do with making the December deathrate the lowest on record. The opening week of the new year, although not fully maintaining the record of the previous month, was reported to be satisfactory.

FOREIGN NEWS AND NOTES

GENERAL.

Prussia's Scourge.—Of the 702,147 deaths recorded in Prussia in 1904, 69,326 were caused by tuberculosis and 54,815 by pneumonia.

"Nose-drinking," a New Vice.—In Norway there is a short cut to intoxication much favored in the city slums. The drunkard fills the palm of his hand with "aquevit" (strong corn brandy) and sniffs it through his nose. A few applications do the work, while the same quantity of liquor taken into the stomach would hardly be felt. "Nose-drinking" has become a real vice with some individuals, Norwegian papers say. The effect of it is terrible, because the whole nervous system is paralyzed in a moment, and the drunkard remains almost unconscious for several minutes. Afterward a sleepy fatigue is felt, as after smoking opium.

OBITUARIES.

Selwyn A. Russell, January 11, at his home in Poughkeepsie, N. Y. He was graduated from Albany Medical College, Albany, N. Y., in 1877. Dr. Russell's death was caused by his trying to obtain practical knowledge by testing his theory that people eat too much; he had taken no food for a week.

Robert W. Steger, of Chicago, was found in an unconscious condition, due to a dose of chloroform and morphin, in a hotel in New York, and died in Bellevue Hospital January 2. He was graduated from the University of Nashville, medical department, in 1877.

E. C. Dent, January 12, suddenly, from heart disease, at his home in New York City. He was graduated from Bellevue Hospital Medical College in 1879, and for 25 years served as superintendent of the Manhattan State Hospital on Ward's Island.

William B. Stoner, aged 60, of Sunbury, Pa., January 9, at the Clifton Springs Sanatorium, N. Y. He was graduated from the Kentucky School of Medicine, Louisville, Ky., in 1892.

M. E. Chartier, January 8, suddenly, in Biloxi, Miss. He was graduated from the University of Paris. His work was mostly among the poor, for which he made no charge.

Alexius L. Middleton, aged 73, January 8, suddenly, at his home in Piscataway District, Prince George County, Md.

THE PUBLIC SERVICE

Changes in the Medical Corps of the U. S. Army for the week ended January 13, 1905:

So much of orders of September 11, as direct First Lieutenant ALLIE W. WILLIAMS, assistant surgeon, to proceed to the Philippine Islands on the transport to sail from San Francisco, Cal., January 5, are so amended as to direct him to report at San Francisco for duty as surgeon of the transport Meade during the next voyage of that transport to Manila, P. I.—EDWARD OOLE, sergeant first class, now at Cleveland, O., is relieved from further duty in the Philippines Division, and on or before expiration of furlough will report at Fort Ethan Allen for duty.—GEORGE REYNOLDS, sergeant first class, Vancouver Barracks, will be sent to San Francisco, Cal., reporting to the medical superintendent, army transport service, for duty aboard the transport Meade.—WILLIAM D. EVANS, sergeant first class, Key West Barracks, will be sent to Fort McPherson for duty.—RUSH CAMERON, sergeant first class, Fort Adams, will be sent to New York city, reporting to the medical superintendent, army transport service, Army building, for duty aboard the transport McClellan.—First Lieutenant PHILIP W. HUNTINGTON, assistant surgeon, will upon his arrival at San Francisco, Cal., proceed to Fort Rosecrans for duty.—GEORGE NEWLOVE, contract surgeon, extension of leave granted October 21 is further extended 15 days. Upon the expiration of his present leave will proceed to New York city for duty as surgeon of the transport McClellan during the next voyage of that vessel to Manila, P. I.—The following-named officers are assigned to stations as follows, for duty: Captain Joseph H. Ford, assistant surgeon, to Malabang; First Lieutenant Clarence L. Cole, assistant surgeon, to Cotabato; Captain George P. Peed, assistant surgeon, to Camp Overton; First Lieutenant James W. Van Dusen, assistant surgeon, to Camp Keithley; First Lieutenant George W. Jean, assistant surgeon, to Jolo, Jolo. First Lieutenant WILLIAM P. BANTA, assistant surgeon, will proceed to Camp Stotsenburg, Pampanga, for duty.—First Lieutenant E. D. KILBOURNE, assistant surgeon, is granted leave for one month.—First Lieutenant JOHN H. ALLEN, assistant surgeon, is granted leave for 20 days, to take effect upon return of Contract Surgeon Harry H. Van Kirk to duty at Fort Sill.—CLARENCE F. DICKENSON, contract surgeon, is relieved from duty at Fort Logan and will report to the commanding officer, Second Infantry, for duty to accompany that regiment to the Philippine Islands. Upon arrival at Manila he will report to the commanding general, Philippines Division, for assignment to duty.—WALLACE E. PARKMAN, contract surgeon, leave granted October 18 is extended one month.—SAMUEL A. WEIR, sergeant first class, Plattsburg Barracks, will be sent not later than January 25 to New York city, reporting to the commanding officer, transport McClellan, for transportation to Manila, P. I.—FREDERICK S. MACY, contract surgeon, upon the abandonment of Allegheny Arsenal, Pa., and the completion of the duties to which he has been assigned by the commanding general, department of the East, will proceed to Fort Adams for duty.—So much of orders, October 4, as direct that Sergeant First Class PAUL COMPTON will be sent to the depot of recruits and casuals, Fort McDowell, are

revoked.—PAUL COMPTON, sergeant first class, now at Morrow, O., having relinquished the unexpired portion of his furlough, will report at Fort Wayne not later than January 18 to accompany the First Infantry to Manila, P. I.—J. SAMUEL WHITE, contract surgeon, is relieved from further duty at Fort Snelling, and at the expiration of his present leave will proceed to Governor's Island, N. Y., and report for assignment to duty to accompany the First Infantry to the Philippine Islands. Upon arrival at Manila he will report to the commanding general, Philippines Division, for assignment to duty.

Changes in the Medical Corps of the U. S. Navy for the week ended January 13, 1906:

P. LEACH, surgeon, detached from the Massachusetts, when placed out of commission, and ordered to the Indiana.—W. A. ANGWIN, assistant surgeon, detached from the Massachusetts, when placed out of commission, and ordered to the Indiana.—L. O. SCHETKY, pharmacist, ordered to the Naval Hospital, Norfolk, Va.—T. C. BLACKBURN, acting assistant surgeon, detached from the Franklin, ordered home, and granted leave until expiration of appointment as acting assistant surgeon, January 23.—E. E. CURTIS, acting assistant surgeon, ordered to the Franklin.—P. F. MCMURDO, acting assistant surgeon, detached from the Franklin, ordered home, and granted leave until expiration of appointment as acting assistant surgeon, January 23.—J. T. MILLER, acting assistant surgeon, ordered to the Franklin, January 15.

Changes in the Public Health and Marine-Hospital Service for the week ended January 10, 1906:

EUGENE WASDIN, surgeon. Leave of absence granted Surgeon Wasdin for one month from December 15, 1905, amended so as to be effective from December 17, 1905.—P. M. CARRINGTON, surgeon, directed to proceed to El Paso, Texas, for special temporary duty.—J. A. NYDEGGER, passed assistant surgeon, granted leave of absence for one day, January 2, 1906.—E. K. SPRAGUE, passed assistant surgeon, relieved from duty at Ellis Island, N. Y., and directed to proceed to Cape Fear Quarantine Station and assume command of the Service.—JOS. GOLDBERGER, passed assistant surgeon, relieved from special temporary duty at New Orleans, and directed to rejoin his station in Washington.—B. H. EARLE, passed assistant surgeon, granted leave of absence for four months from February 4, 1906.—R. E. EBERSOLE, assistant surgeon, relieved from duty at Tampa Bay Quarantine, and directed to proceed to San Francisco, Cal., and report to the medical officer in command for duty and assignment to quarters.—F. H. McKEON, assistant surgeon, relieved from duty at New Orleans, La., and directed to proceed to San Francisco Quarantine Station, reporting to the medical officer in command for duty and assignment to quarters.—R. D. SPRATT, assistant surgeon, relieved from duty at Louisville, Ky., and from temporary duty at Gulf Quarantine Station, Miss., and directed to proceed to Mobile, Ala., assuming temporary charge of the service at that port.—M. C. GUTHRIE, assistant surgeon, relieved from duty at Cape Fear Quarantine Station, and directed to proceed to New York and report to Surgeon Stoner, Ellis Island, N. Y., for duty.—L. C. BEAN, acting assistant surgeon, granted leave of absence for two days from January 8, 1906.

Boards Convened.—Board convened to meet at Boston, Mass., for the physical examination of an inspector in the Immigration Service. Detail for the board: Surgeon R. M. Woodward, chairman; Acting Assistant Surgeon F. H. Cleaves, recorder. Board convened to meet at Philadelphia, Pa., January 9, 1906, for the physical examination of an officer of the Revenue Cutter Service. Detail for the board: Surgeon F. Irwin, chairman; Assistant Surgeon H. McG. Robertson, recorder.

SOCIETY REPORTS

THE SOUTHERN SURGICAL AND GYNECOLOGICAL ASSOCIATION.

Eighteenth Annual Meeting, Held in Louisville, Ky.,
December 12, 13, and 14, 1905.

[Specially reported for *American Medicine*.]

Surgical Repair of Injured Nerves.—J. SHELTON HORSLEY (Richmond, Va.) reviewed the work of recent investigators on the histologic regeneration of nerves. He alluded to the views of Bethe and others, who claim that regeneration of a peripheral nerve can take place without central connection. He classified the surgical methods of repair as follows: 1. Simple nerve suture, including all cases where the ends of the nerve are brought into direct contact and sutured, even when nerve stretching or resection of the long bone may be necessary. 2. Flap operations, which were usually unsatisfactory. 3. Nerve bridging. By this term was meant those cases in which a foreign substance was used to bridge over the defect between the ends of a divided nerve. This included not only transplantation of nerve tissue from lower animals, but also suture à distance. 4. Nerve implantation or anastomosis. Under this head were included those cases in which the ends of an injured nerve were implanted into a healthy nerve. He reported a case falling under the last classification. The patient had suffered an injury, as a result of which the upper part of the median nerve had been destroyed for two and a half inches and the musculospiral injured in the lower part of the arm with paralysis of all muscles in the hand and forearm, except those supplied by the ulnar. Three months after this the median was implanted laterally into the ulnar. Fourteen months later both flexion and distention had returned to a marked degree. At that time the musculospiral was cut across and implanted laterally into the median. Ten months after the second operation, sensation and motion of the hand and forearm had almost completely returned. In discussing several points connected with the case, Horsley concluded that the extensors must have been supplied through the anterior interosseous of the median, because flexion and extension improved simultaneously, and because extension was not interfered with at the second operation, when the musculospiral was completely divided.

Discussion.—CHARLES H. MAYO (Rochester, Minn.) said one question that interested him more especially was the difference in the ability of repair of a sensory nerve and a motor nerve, also combined sensory and motor nerves. For instance, about the head, where we had the purely motor and sensory nerves it was almost impossible to keep a sensory nerve from uniting itself. It would get out and grow for inches and repair itself; but a sensory nerve having peripheral impulses toward the center seemed to lack regeneration like a motor nerve in which the impulse came from the center out. He had taken out the infraorbital, plugged the opening with silver, and had a case as many as seven years without return of sensation in that area, yet within a few months, after operating again and removing the silver plug, the sensory nerve, which had been lying dormant for this length of time, would get out, hunt up a partner, so to speak, and go to work. Take the motor nerve of the arm, where there were acute sensory and motor nerves, we would get more rapid regeneration because of the peripheral impulses, and as the sensory nerve of the arm was so much in excess over that of the leg, we would get earlier repair in the surgery of nerves of the arm than we would in the leg. HORSLEY, in closing the discussion, called attention to the point that his patient was of a low grade of intelligence, whose nervous system was not well developed, and the same law applied here as would apply to other similar cases, namely, the lower the type of organism, the more rapid and more active the repair.

Gallstones in the Cystic Duct.—L. H. DUNNING (Indianapolis, Ind.) presented a method which he had employed in a case which greatly facilitated the pressing backward into the gallbladder of a stone impacted in the cystic duct. In this case the gallstone was lodged in the cystic duct in front of a small stricture. After making all the efforts he deemed prudent to press the stone backward into the gallbladder, without success, he then unsuccessfully attempted to dilate the stricture with the finger tips and later with forceps. One of his assistants suggested that he thought they could better dilate with the forceps if they could see the stricture. The walls of the gallbladder were elastic. The liver had been turned upward, so that the gallbladder was near the surface. The opening in the gallbladder through which he had been working was enlarged a little, and then the stone was steadied and held against the stricture by an assistant. The fundus of the gallbladder was pushed forward toward the strictured entrance into the cystic duct. They so far succeeded as to bring the opening in the wall of the gallbladder directly opposite to the strictured opening. They then tried to introduce the forceps tips, but failed. Picking up a pair of probe-pointed scissors curved on the flat, the point was gently worked through the fistula and the scissors opened; this did not dilate the opening sufficiently, so the edge of the fistulous ring was snipped slightly in two or three places, when they were able to dilate the fistula so as to permit the easy exit of the stone. The operation was completed in the usual way. A rubber tube was fastened in the gallbladder and that viscus anchored to the fascia. Before they had finished the operation a little bile had flowed into the gallbladder. Two or three ounces of bile were discharged from the tube daily; at first it was dark and thick, but gradually approached the normal color and consistency. The patient made an uneventful recovery and had but little further pain or soreness in the gallbladder region. He thought the procedure adopted in this case might be found of service in others. It was not applicable to cases in which the gallbladder could not be brought near the surface, or where the gallbladder was thickened by inflammatory deposits. In the author's experience in operating upon 93 cases of gallstones, there were 10 cases of stone in the cystic duct requiring considerable effort to dislodge them. In two of the cases early in his experience, the stones were crushed and portions left behind, subsequently giving so much trouble that cholecystectomy was finally performed.

Common Duct Obstruction.—J. WESLEY LONG (Greensboro, N. C.) stated that, as compared with gallstones in the gallbladder, the condition was many times more serious. He quoted the as yet unpublished statistics of the Mayo clinic, where there had been more gallstone operations done than in any other clinic in the world, showing that in simple gallstones in the gallbladder the mortality of operation was less than one-half of 1%, while the mortality in operations for common duct obstruction ranged from 11.9% in benign cases to 40% in malignant cases. These facts were brought out to emphasize the prophylactic value of operating while the stones were yet in the gallbladder. Touching the etiology of common duct obstruction, he took the position that practically all cases were due either to stones or to malignant growths, which, themselves, were caused by the irritating presence of stones. Gallstones might exist in the gallbladder for a long while without producing symptoms, but once in the common duct, not only pronounced symptoms, but many serious complications arose. The mortality in these cases was due to the complications, the cholemia, infection, inflammation, and exhaustion, due to hemorrhage at the operation. He emphasized the fact that common duct obstruction could be treated only by surgical methods. After removal of the obstruction, the first consideration was drainage, since it was imperative to overcome the infection; and, second, that no operation must be deemed finished until

the patency of the opening into the duodenum was assured. Attention was called to the importance of not removing the gallbladder in the operation of choledochotomy, since stones occasionally reformed in the common duct, and in these cases the gallbladder served for drainage. A number of cases of operation for common duct obstruction occurring in the hands of Long were reported, showing the profound disturbance caused by the stones and the great relief afforded by their removal. In one case it was noted that the stones had ulcerated through the side of the gallbladder and into the common duct, an exceedingly rare occurrence.

Gangrene of the Gallbladder; Rupture of the Common Duct; a New Sign.—JOSEPH RANSOHOFF (Cincinnati, O.) reported a case of gangrene of the gallbladder in a male patient, aged 21, with recovery following operation. The second case was one of rupture of the common duct with an unusual sign. Operation was done, followed by recovery of the patient. Although the cases differed in many important points, they had enough factors in common to warrant their consideration together. In each of them a rapidly developing peritonitis made an operation imperative as a vital indication. In each the operation revealed a condition which to the naked eye at least had all the earmarks of a peritonitis, which might speedily cause death. In one there was an unruptured but gangrenous gallbladder, the contents of which were proved to be sterile; in the other, there were large quantities of free bile in the peritoneum. He called attention to a sign which was noticed in the case of ruptured duct before the incision was made, and one to which he believed attention had not been directed. It was a localized jaundice of the umbilicus. Although a single case was not usually sufficient to warrant the assumption that something new had been observed, this feature was so marked that he could not refrain from believing that further observation would give to this localized jaundice some value as a sign of free bile in the peritoneal cavity. In the case presented this feature gained in interest, as the staining of the subperitoneal fat with bile was observed in the incision through the abdominal wall. The jaundice was doubtless purely the result of imbibition. It made itself manifest first in the integument of the navel, because this part was thinner than the rest of the abdominal wall. Total gangrene of the gallbladder had to his knowledge not been observed except in the case presented as an affection independent of gallstones. Total gangrene of the gallbladder is rare. In the case reported a most careful search failed to reveal the presence of a stone.

[To be continued.]

WESTERN SURGICAL AND GYNECOLOGICAL ASSOCIATION.

Fifteenth Annual Meeting, Held in Kansas City, Mo.,
December 28 and 29, 1905.

[Specially reported for *American Medicine*.]

The Transvesical Operation for the Relief of Prostatism in Aged Males.—CHARLES E. BOWERS (Wichita, Kans.) read a paper on this subject. He stated that more conservative and rational operations would yield better results and lower the mortality percent. An exact diagnosis in many cases could only be made upon suprapubic exposure of the vesical outlet. The suprapubic operation could be done with greater exactness and would yield better results than the infrapubic in morbid conditions in the male, as had been the case in the female pelvis. The suprapubic route was as rationally indicated for the relief of the above-named obstructive conditions at the urinary outlet as it was in vesical calculus. The perineal operation offered only 30% of cures, with a mortality of 7%, and a 50% chance of having exchanged one urinary difficulty for another and not infrequently a lesser for a greater one; while the transvesical operation

entirely relieved all who survived it of their urinary trouble, if it was due to obstruction in and about the vesical outlet, except when they were carcinomatous in character, without sequels and with the improved operative technic of today no greater mortality. The controversy that was now going on relative to perineal and suprapubic prostatectomy was only a repetition of the one waged when lithotomy was undergoing its evolution. Who today cuts for stone in the male bladder via the perineum? The most essential thing today was to bring home the facts to the profession in general: 1. That prostatism was due to other causes than hypertrophy of the prostate gland. 2. That the transvesical operation for prostatism had attained a sufficient degree of perfection to be recommended to this class of pitiable sufferers, with the assurance of a cure if undertaken before the inflammatory process had reached the kidney and arrested its functional activity. 3. Patients should not be submitted to catheterism in the future as they had been in the past until it was hopeless to interfere surgically.

Discussion.—HENRY T. BYFORD (Chicago) in speaking of the etiology of enlarged prostate, thought the condition was due to some irritation; that the condition could not come entirely from age alone or from the sclerotic changes which occurred with age. In some cases of enlarged prostate there was doubtless a gouty diathesis, and that perhaps the treatment recommended by Fletcher in his book, of reducing the calories from 3,000 to 1,500, and perhaps dieting a little, would obviate the necessity of suprapubic prostatectomy in some cases. JAMES E. MOORE (Minneapolis, Minn.) stated that 20 years ago or more he did his first prostatectomy suprapubically, and as it was done at that time it was a blind, bloody, and unsatisfactory operation. A few years ago, when perineal prostatectomy was suggested and practiced so successfully, he took it up and had been advocating it ever since, always maintaining that there were certain cases that could be operated better by the suprapubic route as it was done at the present time. However, in his judgment if a man was not broadgauged, he did not do the best work he could do until he performed both operations. He believed the perineal route was the choice in the vast majority of cases and by the vast majority of surgeons. W. W. GRANT (Denver Colo.) said he had maintained for years that in the average case the perineal operation was the more desirable one. In cases in which there were pus, hyaline and granular casts, the perineal route was indicated. The dirty cases could be better and more safely operated through the perineum; the clean cases by suprapubic cystotomy by the wellknown modern methods. J. W. ANDREWS (Mankato, Minn.) believed that there were selected cases which should be operated by the transvesical route, but in the majority of instances the perineal route was the better. He had operated 11 times, with one death. One of the operations was suprapubic. He found it difficult, unclean, and was unable to get good drainage. Lack of drainage was one objection to the suprapubic route. The drainage was not and could not be as good as it was through the perineum. M. L. HARRIS (Chicago) said that when one attempted to generalize from a few cases in surgery, these generalizations were always wrong. The essayist had generalized from 12 cases that the suprapubic route was the only one to be done, consequently he thought he was wrong. There were many cases in which a good and thorough operation could not be done suprapubically. There were also many cases in which the best operation could only be done suprapubically; consequently the surgeon must select the best operation for the particular case. Every case of prostatism should be accurately diagnosed before an attempt was made to select the method of operation, and the surgeon could only make such a diagnosis when he employed all the means at his command, and one of these was a thorough cystoscopic examination.

[To be continued.]

CLINICAL NOTES AND CORRESPONDENCE

[Communications are invited for this Department. The Editor is not responsible for the views advanced by any contributor.]

LOCOMOTOR ATAXIA.

BY

P. M. WISE, M.D.,
of New York.

To the Editor of American Medicine:—Locomotor ataxia as a disease is notorious as a resource of quackery. From my point of view this is largely due to professional pessimism. If physicians would not practise such bald frankness with patients and assure them that beyond peradventure they were doomed to progressive and horrible disability until relieved by extinction, they would enhance their prerogative and be saved from voicing a material, although universal error, for tabes is not inevitably progressive or incapable of arrest, or even cure. It is not resistant to treatment. The orthodox treatment may be so considered, perhaps, for it consists largely of a mixed treatment or so-called nerve tonics, but symptomatic treatment and effort to relieve complications, especially disorders of nutrition, is rare indeed with the profession at large.

The ataxic subject, like the tuberculous, especially in the earlier stages, is peculiarly hopeful. He is not in sympathy with his sceptical doctor, and does not believe he is beyond cure. Therefore when he meets a promise of cure, which he inevitably does, for the promise seeks him out as a matter of trade, he falls into the trap and stays as long as his money lasts. Of the wage earners who have come under my observation, in whom the duration of the disease was three or more years, penury has been the rule; and it is not rare that fortunes have been squandered in vain attempts to regain health by following false promises; for these conscienceless fakirs are good business men and base their demands largely upon the capacity of their victims to pay. In one case which was told to me by an observer, the patient was worked up to such a pitch of fear and excitement that he was forced to sign a check for \$5,000 before he left the room, or he would not be treated by what he was made to believe was the only way to save his life. This seems incredible, but the devices of these impostors are ingenious, and their false clinical presentments bear nothing of truth. His subsequent death was doubtless the result of the theatric abuse of therapy he received for his money. Cases of this kind are not rare. Ataxic subjects of means are exceptional who cannot relate an experience of this nature, although few are as radical.

I fancy that in large measure the bigoted intolerance of most physicians against anything therapeutic for tabes is to blame for much of the foregoing conditions. In the first instance the tabetic quite invariably consults his home doctor, who, as a rule, establishes the diagnosis. This is the starting-point for "no hope who enters here," and the forlorn patient is turned adrift, to seek help elsewhere or not, as he pleases. Naturally, an unqualified prognosis excludes any further approach of the "fatalist" to confer relative to other "treatments," whereas the physician (the home doctor) should always remain the counselor and friend, if not the medical attendant. A patient came to me, less than five years since, from a "prominent physician in America," with the parting advice to eat, drink, and make merry, for he would soon die in any event. Within a year this man resumed his former vocation, and is today quite well and happy, although in a measure disabled. With a discouraging uniformity, the several hundred I have observed since then tell much the same tale; especially discouraging because it comes from the source for which they naturally have the greatest respect. These doctors are often right, it is true, but this is no excuse for an attitude which is hurtful to both them and their patient.

In a few instances in which I have tried to follow my rule of cooperating with the local doctor, I have been roundly denounced by him as a fraud for attempting to treat a patient whom he had declared incurable. In not a few instances the later development of these cases has been an exhibition of "eating crow."

I would appeal to practitioners, who have the first opportunity to treat patients with locomotor ataxia, to assume more optimism, or at least less prohibition of possibilities. At any rate keep the position of counselor and invite the patient's confidence, and you may save him from disaster. Do not condemn what you do not know or have not tried. Be reasonable and conservative.

THE FREE-LANCE VS. THE MAN IN PUBLIC LIFE.

BY

JOHN S. FULTON, M.D.,
of Baltimore, Md.

To the Editor of American Medicine:—Several weeks ago *American Medicine* called attention to the unfair advantage enjoyed by the critical free-lance, who may thrust at will against any and all official delinquencies, finding much sport and little danger in the exercise; because a public man risks his official character in all his acts, while the free-lance hazards nothing of like value, whatever else he may expose to counterattack. I am reminded of this admirable editorial by a more recent one (December 2, 1905) in which *American Medicine* comments on my reticence concerning Mr. E. T. D., of Baltimore, who says that he made unlawful use of money in order to get unlawful possession of the dead body of his child, unlawfully held by the health authorities of a western city, where the death occurred on July 13, 1904. After characterizing this "kidnap and ransom of a stranger's dead child" as a nameless and revolting crime of cupidity, you ask: "Is it not the business of any man, having knowledge of such an outrage, to give the matter full publicity?" The form of this inquiry suggests an affirmative answer, and I admit that the question does not present itself to me in another form. If every ethical question could be settled on general principles, the affairs of this world would be greatly simplified. Only one of the accepted formulas seems to quite fit this case. I have done for the western health commissioner just what I should like him to have done for me if the situation had been reversed. Against the protest of Mr. D., the victim of the crime alleged, I have communicated the allegations to the head of the department implicated. The health commissioner thanked me for my interest in the matter, and said that he would call upon me later, if he should need more of the assistance which I offered. He has since retired from office, but the man expressly incriminated by Mr. D. retains his former position in the health department. Mr. D. wishes me not to expose the official who, he now says, simply accepted a gift from him. If I should declare freely all the details of Mr. D.'s statements to me, what crime would be uncovered? Bribe-taking? Or libel? Each of the principals in this scandalous affair knows that the evidence in my possession is unwillingly guarded, and both of them know that the prevailing practice in American mortality registration lends but a thin veil to their identity. Whose move is it? Not mine.

Large Vesical Calculus.—On January 1 the surgical staff of the Cambridge, Md., Hospital took from the bladder of a patient a stone weighing 4½ ounces, and about the size of a large duck egg. The patient is doing well and is now pronounced convalescent. This is believed to be one of the largest stones on record extracted from a person who survived the operation. Larger stones have been extracted but the patients have not survived.

ORIGINAL ARTICLES

ACUTE OSTEOMYELITIS: A PLEA FOR EARLY DIAGNOSIS.¹

BY

EMIL KING, M.D.,

of Fulda, Minn.

Osteomyelitis is an acute inflammatory process affecting bone and periosteum, and is the result of hematogenous infection. It occurs at all ages, but is by far most common during infancy and early childhood. At this time of life the tissues are in an undeveloped state; the bones, and especially the epiphyses and diaphyses, are in the embryonal condition, their blood supply is superabundant, while the power of resistance to bacterial infection is low. The disease attacks most frequently the femur, tibia, long bones of the upper extremity, and then any other bone in the order mentioned.

As in disease, generally, several factors combining bring about abnormal conditions, and this is especially true of osteomyelitis. For convenience, I will divide the causes into predisposing and exciting. Of the former there are many, in fact anything which lowers vitality, and we may mention particularly measles, scarlet fever, typhoid fever, pneumonia, influenza, erysipelas, furunculosis, acute inflammatory affections of nose and throat, gastrointestinal disorders, and simple exposure to cold. The exciting cause is necessarily bacterial infection. How the organisms gain entrance to the blood stream is at times impossible of detection, and having once gained entrance they may remain dormant until conditions are right for their development. Frequently there is a break in continuity, a scratch, puncture, or cut, in infants a septic umbilical cord, in older children and adults, perhaps carious teeth. Often no such apparent cause is found; however, there is usually a history of some trauma, such as a contusion or sprain, and this trauma may be so slight as to escape notice.

On bacteriologic examination of the pus, *Staphylococci aureus* and *albus* and the streptococci are found most frequently; rarely *Bacillus pyocyaneus*, the typhoid and influenza bacilli; the latter only when osteomyelitis follows as a sequel to these diseases.

The earliest symptoms are malaise, soon followed by a chill, or, in the very young, convulsions. The temperature rises rapidly, as does also the pulse-rate, which is out of proportion to the height of the fever, the respirations are increased, the tongue becomes heavily coated and the spleen enlarges. Emaciation is rapid, the patient assuming in a few days a decidedly typhoidal appearance.

Pain is an early symptom, and is felt at the epiphyseal lines or at the point where the nutrient artery enters the bone. It rapidly becomes severe, and is described as being of an excruciating and boring character. It will increase in intensity until necrosis permits the exudate to escape into the surrounding softer tissues, thereby relieving pressure. Swelling is also apt

to appear early, and redness of the skin with local heat are present when the abscess approaches the surface. Naturally we observe also deformity with loss of function, due to the swelling and contractures through nature's effort to place the affected part in the easiest possible position.

This disease is of an extremely variable type, some cases running a mild course with but little systemic involvement or severe local signs, while in others the system is overwhelmed by toxins, death resulting in from 24 to 72 hours, before a correct diagnosis can be made.

I shall not consider the symptoms of the subacute and chronic stages. When this point is reached, the diagnosis is self-evident and probably severe damage has been done. Suppuration is usually present four or five days after onset, hence treatment to result in a quick and perfect recovery must indeed be prompt.

Theoretically, the diagnosis in these cases should present no great difficulties, yet a study of the literature and my own experience show that these patients generally receive proper treatment only during the subacute and chronic stages, that they are treated for some other affection, and that the serious consequences of delay are not properly realized. Indeed it is my opinion that an early diagnosis is often very difficult, that the attending physician may make an error even when alert, and having this very affection in mind. Given a patient with a history of some slight injury, who may have had some recent illness and who suddenly develops fever with pain, the possibility of a developing osteomyelitis must be kept in mind and must be surely excluded.

In seeking for the cause of the systemic involvement, our attention will, perhaps, be called to localized tenderness. Patients old enough to walk are lame, or in infants handling causes pain. Very early in the history there may be no swelling, yet a careful palpation will locate a point of great tenderness. In long bones this point is at the epiphyseal line and the periosteum is found thickened. Very soon, however, edema of the subcutaneous tissues above or below the seat of infection develops, and this sign is, by some very competent authorities, regarded as pathognomonic of this disease. This edema also affects the periosteum, and may be followed from day to day in its extension along the line of the shaft. Postural signs are also present, due to muscle spasm and contracture; thus in the lower extremity the knee is flexed on the thigh and the thigh on the body, while the leg is adducted or abducted. Movement always increases the pain, thus I have seen children cry for half an hour after the most gentle examination. Deep fluctuation, due to pus beneath the periosteum, usually develops within a week. At this time the acute stage is at its height, the patient is greatly reduced in weight and presents a marked cachexia. The agonizing pains will now lessen, owing to the escape of the exudate from its tense confinement in the shaft of the bone, or under the periosteum into the surrounding softer tissues, and anodynes may no longer be needed. Local swelling and fluctuation now become more marked, and the exudate finding its way to the surface may cause the discoloration of the skin already mentioned. If the

¹Read at a meeting of the Southwestern Minnesota Medical Society, held at Sibley, Iowa, June 27, 1905.

abscess is now opened or breaks spontaneously, great relief is afforded, the appetite returns and a steady gain in strength and flesh sets in.

The diseases most often causing errors in the diagnosis of acute osteomyelitis are rheumatism, typhoid fever, deepseated cellular abscesses, sprains, erysipelas, tuberculous bone disease, scurvy, sarcoma, neuralgia, and growing pains. Of these, rheumatism and typhoid fever lead astray most often.

Acute rheumatism, let us bear in mind, is rare in childhood; the systemic involvement is not so severe, there is not the rapid wasting nor the peculiar cachexia, acid sweats are the rule, while they are absent in osteomyelitis. Acute inflammatory rheumatism is an arthritis, the joints are hot and tender, it is usually multiple and changes its location with surprising rapidity. Osteomyelitis is, as a rule, confined to one spot, nor is the joint itself affected during the early stage. The point of greatest tenderness is at the epiphyseal line or over the shaft of the bone. One point in differential diagnosis mentioned by many authors is that in osteomyelitis, tapping the bone in its long axis will cause intense pain, yet in one of my cases this test was negative at all times. From typhoid fever the differential diagnosis should be easier. This disease is also comparatively rare in children. It presents a longer prodromal stage than does osteomyelitis, the temperature curve shows a gradual rise, nor does the patient so quickly present a picture of severe illness. The aches and pains in typhoid fever are not so severe nor are they confined to one particular spot. During the second week the Widal test may be of value, but a test of far greater importance is a differential blood count. It has been shown that in septic infections there is a decided leukocytosis, the white cells ranging from 18,000 to 30,000. In uncomplicated typhoid fever they are normal. Deepseated cellular abscesses, as a rule, develop slowly and do not give the marked systemic reaction noted in osteomyelitis; they do not occur near joints, excepting the hip, nor along the shafts of long bones, but usually in more fleshy parts, the nates, axillas, and in children, the neck. In erysipelas the skin is intensely inflamed and is of a dark rose-red color with gloss; there is a distinct line of demarcation and the pain is of a burning character. Postural signs are also absent; deep pressure does not cause such intense pain nor is the patient so ill. The other affections mentioned as simulating osteomyelitis do not, as a rule, develop so acutely and a thorough elicitation of the history and a careful physical examination will serve to prevent error. One other valuable aid in the diagnosis of these cases is the röntgen ray. Such an examination will show the thickening of the periosteum, the abscess formation, in later stages the osteoporosis and nature's efforts at repair by enclosing the dead bone with an involucrum, the possible epiphyseal separation or more rare pathologic fracture. An early röntgen ray examination will certainly lead to more thorough diagnosis and efficient treatment by revealing the extent of the bony lesion.

The complications of osteomyelitis are infections of joints by contiguity or through the blood and lymph channels, general pyemia, septic emboli and amyloid degenerations after long-continued suppuration.

The prognosis as to life is good, the fulminating fatal cases being fortunately rare, but aside from this question of life or death it is rather pitiable. Too many such patients go through life as cripples with ankylosed joints, contracted muscles or shortened limbs, a sad thing truly when we realize that early diagnosis with prompt and thorough treatment will lead to quick recovery, a saving of much suffering and perfect restoration of function.

I shall consider treatment but briefly, since my purpose is to call attention to the necessity of early diagnosis. Medicinal treatment, aside from relieving pain, is worse than useless, since it leads to procrastination. The only proper measure is prompt operation, cutting down through the infecting focus, which can usually be determined as the point of greatest tenderness on palpation or over the center of periosteal thickening, removing the infection and establishing drainage. If the point of infection is removed, the severe symptoms at once subside and a rapid recovery follows. If pain and fever continue after an incision down to bone it is certain that the infection is still deeper. Prompt trephining into the marrow cavity must be done, for the patient is not relieved unless pain and high fever cease. The stage during which so simple an operation suffices is, however, short, since the shaft of a long bone may be entirely devitalized within 48 hours.

The following cases are interesting from the diagnostic point, and are given because we should draw lessons from our failures as well as our successes.

CASE I.—F. H., male, aged 12; family and early history is unimportant. While working in a garden in April, 1901, he cut a gash on the outside of his right foot with a hoe. This wound healed slowly without medical assistance. July 20, he stubbed the right foot on a raised board on a sidewalk, jarring the leg rather severely. Immediately he felt a dull pain above the ankle externally which increased from day to day. Lassitude and fever developed and on July 24 medical advice was sought. On July 29 an incision was made externally just above the ankle, blood and serum only escaping. On July 31, the family requested counsel as the boy was getting steadily worse. The medical attendant refused to meet the counsel chosen and retired from the case. At this time I was asked to take charge of the case. The boy had a high fever, heavily furred tongue, the leg was edematous from the toes to above the knee. Deep fluctuation was present below the knee on the outside. The pain in the tibia was very severe and the wound made two days before was dry and clean. I suggested immediate operation to which consent was reluctantly given by counsel on the plea that the point of infection could not be determined. I made an incision just below the knee down to the fibula and tibia, serum and some flocculent pus escaped. The periosteum was but little thickened, no denuded bone could be felt. Drainage was inserted and we decided to await developments. The pain was not relieved nor was the patient's condition otherwise changed. On August 2, the operative wounds began to discharge bright yellow pus freely and the next morning a small abscess was discovered on the left anterior superior spine of the ilium which was at once incised and packed with gauze. Numerous small abscesses now developed in quick succession over bony points such as the wrists, elbows and costal cartilages and one, rather interesting, over the hyoid bone. The boy died August 26, from exhaustion due to general pyemia. I doubt if any operative interference would have saved his life when I first saw him as sepsis was very likely

already general. I should, however, have insisted on trephining into the tibia; pus would certainly have been found.

The case teaches that a more extensive operation is often necessary than seems apparent and that the search for the infecting focus must be continued from day to day if the symptoms do not subside.

CASE II.—M. R., female, aged 4. This girl was brought to me on September 23, 1902, with a history of a fall a few days previously. She was bright, not feverish, but refused to have her leg touched. I placed her under moderate anesthesia and found a slight thickening at the epiphyseal line below the right knee. There was a little localized swelling. In view of her good condition and the reported accident I made a diagnosis of epiphyseal injury, applied a long splint to the outside of the leg to secure rest and a lead and opium lotion over the seat of injury. She was taken home with the promise to keep me informed of her condition. I heard nothing of her for 10 days. Her father then informed me that she was very ill, had much fever and great pain. His reason for not reporting her condition as agreed upon was the fear of expense and his belief that she would be better every day. I found her in a typhoid condition, high fever, moaning with pain. Her leg was edematous from toes to hip. Even at this time her parents were opposed to operative interference. I succeeded in getting permission to open the abscess only by threatening to withdraw from the case. The abscess extended from the knee to the ankle. No denuded bone could be felt, but I cut through the periosteum and then inserted gauze packing into the wound. Her parents refused permission for another visit unless she should get worse, even after my explanation of her serious condition. A month later her father reported her as being much better and paid my bill. From other sources I learned that she still has a discharging sinus at the present time. This case I frankly misunderstood, an incision when I first saw her would have cured her quickly.

CASE III.—D. B., male, aged 12. There is a history of tuberculosis in grandparents on both sides, though parents, uncles, and aunts are all healthy. He is small for his age, delicate in appearance, yet has always had good health, except occasional joint pains, which his parents called rheumatism. Late last November he had a mild attack of measles, which kept him from school a week. About December 20, he sustained a small abrasion over the right patella and an injury to his right wrist, in consequence of a game of leap frog. He skated every day, and was more or less exposed to the cold, up to January 1, at which time he began feeling badly, and pains appeared in his right thigh. I saw him on January 4. His temperature was 103.5°, pulse 140, tongue furred. There was great pain in the muscles on the outside of the right thigh and there was moderate swelling from the knee to the hip. There was a slight enlargement of the right ulna an inch posterior to the styloid process. This was only slightly painful to pressure. On the right patella, there was a dry scab, around which the skin was normal. My diagnosis was either septic infection or rheumatism. Two days later his condition was practically unchanged, though the pain now included the knee-joint. His urine was high colored and very acid. Tapping the heel smartly did not increase the pain in the leg. Palpation seemed to show the pain to be located in the muscles on the outside of the thigh only, and I now assumed his sickness to be rheumatism and treated accordingly. Two weeks later the pain got much better, but the leg became swollen also on the inside. About February 1, I began to suspect my diagnosis and suggested calling counsel. On February 8, Dr. Thomas Lowe, of Pipestone, Minn., was called. On account of a misunderstanding as to the time of his visit I did not

see the patient with him. His conclusion was that the boy had an abscess, probably of tuberculous origin. I suggested immediate operation, which counsel declined to sanction. At this time emaciation was marked, the thigh was enormously swollen. The ulnar enlargement had increased somewhat but caused no pain. The leg had become everted and the knee was flexed. He did not have much pain and craved food. We put him on a full diet with codliver oil. He gained in weight and appearance. The swelling of the thigh receded slowly during the next six weeks. Now fluctuation became marked at the perineum, and the boy being much stronger we decided to open the abscess. I made a two-inch incision, five inches below the perineum, and found a pus cavity which extended down behind the femur to the knee. The femur was carious. While exploring the cavity digitally a second abscess was ruptured; this one surrounded the upper epiphysis and accounted for the swelling at the perineum. An involucrum had not formed around the femoral shaft, so we simply drained the abscesses. At this time the leg was everted to a right angle with the body. The hip-joint was immovable. After this operation he gained very rapidly in flesh and strength. His temperature, which had varied from 99° to 102° during late February and March, remained below 100°. I examined him June 26. Found him walking with crutches. The leg has come almost into a straight line so he can bear weight on the toes. There is considerable motion in the hip-joint and he looks as well as he did last autumn. At the wrist there is only a slight enlargement, which I believe to be callus in a greenstick fracture. The involucrum around the shaft of the femur is strong and extends along its entire length. This is a case of osteomyelitis of the femur without tuberculous infection. The abscesses formed at each epiphysis and an early operation would have saved the boy much suffering and a possible partial crippling.

In a 12 years' experience in the practice of medicine I find that most of my errors in diagnosis are made in cases that run an atypic course. By that I mean that the symptoms are not well marked of the disease I have in mind or that treatment does not give the expected relief. This last case was apparently not as acute as osteomyelitis usually is, and the pain being referred entirely to muscles I was misled into thinking I had rheumatism to deal with.

In conclusion I beg to say (1) that cases running an atypic course, or not responding properly to treatment, should put the physician on his guard that he may revise his diagnosis; (2) that greater care should be exercised in the examination of patients; (3) that the early diagnosis of osteomyelitis is not always easy, yet can usually be made by bringing to aid all modern methods, such as a blood count and the röntgen ray; (4) that early proper treatment will save much suffering, possibly lifelong crippling, and perhaps life itself.

The *British Medical Journal* states that the trustees of the Pilkington Cancer Research Fund are about to appoint a graduate in medicine, or other qualified person, to carry out a research into the cause, prevention and cure of cancer, under the supervision of the professors of general pathology and of systematic surgery in the Victoria University of Manchester (Professor Lorrain Smith and Professor G. A. Wright). The appointment will be for one year, but may be renewed for a further period of one or two years, and the holder of the post will receive an income of £300 per annum with a grant for laboratory expenses.

SOME MEDICINAL PLANTS OF ANGOLA, WITH OBSERVATIONS ON THEIR USE BY NATIVES OF THE PROVINCE.

BY

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(Published under the auspices of the American Society of Tropical Medicine.)

The study of the plant life of Angola must remain forever linked with the name of Friedrich Welwitsch, whose discovery of that extraordinary plant *Welwitschia mirabilis*, Hook. fl., has made his name familiar to every botanist and over whose tomb have been placed the just words: "*Floræ Angolensis investigatorum princeps*."

Dr. Welwitsch mentioned and described a number of medicinal plants in his published and manuscript writings, but having slight acquaintance with the different Bantu dialects of Angola, his notes on the native names and medical uses of the same are frequently vague and contain erroneous statements. Examples might be cited of Bantu names of plants with meanings such as "grass," "small grass," "tree from the water," "twig from the jungle," etc., and such mistakes have been perpetuated by writers following him.

In the intervals of some pathologic studies undertaken in the colony in question in 1896, 1899, and 1903, I have been able to identify a few species commonly used by the natives for medicines and to collect trustworthy information regarding the manner in which they are applied. All mention, however interesting, of plants other than those commonly employed as native remedies has been excluded. The plants used in treatment consisting of fetish rites only, have likewise been omitted. It must also be borne in mind that these notes apply to the bush natives of Bihé, Bailundo, and Andulo, with their contiguous tribes, and do not include the half-civilized coast blacks. This study does not pretend, therefore, to be part of an academic discussion of Angolan flora, for which I have neither the requisite leisure nor experience, and consequently I have omitted descriptions of the plants which may be easily looked up in Oliver's "Flora" or in Bentham and Hooker.

It need hardly be pointed out that many of the substances imagined by the Bantus to possess therapeutic value are of feeble effect or inert; yet as the object of this paper is not to set forth what the natives might use as medicines but to state what they do use, I have thought it best to make the list as complete as possible. I have grouped the plants under their natural orders. The vulgar names (without which such a study is useless and can neither be added to nor criticized) are in the Umbundu dialect, the language of the Bihéans, Bailundos, and Andulos, with their allied tribes, and have been obtained at the expense of some time and trouble. I append a short bibliography, which will be useful to any one who may be further interested in the subject.

PHANEROGAMIA, DICOTYLEDONS, RANUNCULACEÆ.

Utendulu, *Clematis villosa* var. *scabiosifolia*, De C. The roots are boiled, mashed up, and applied to the skin as a remedy for "Onjuaya," a term which literally sig-

nifies itching, and refers to cutaneous pruritus from almost any cause.

ANONACEÆ.

Olumepe, *Monodora angolensis*, Welw. Fruit eaten for pains in the bowels. Sometimes boiled and its juice drunk for the same purpose.



Fig. 1.—Scene in southern Angola showing *Candelabra Euphorbias*.

BERBERIDACEÆ.

Okafiaufiau, *Podophyllum* sp. Roots eaten raw in the treatment of dysentery.

NYMPHACEÆ.

Evonge, *Brasenia peltata*, Pursh. The whole plant is pounded up and applied raw as a poultice in neuralgic pains and in paralyses.

POLYGALACEÆ.

Utata, *Securidaca longipedunculata*, Fres. A weak infusion of the rootlets is used to cure "olosinga," a somewhat indefinite term which indicates pains in the chest, shoulders, etc. The inner bark of the root contains an active poison which is one of the ingredients of the poison test as employed in Angola. Four gm. of this bark boiled in 30 cc. of water and given to a large female mandril (*Cynocephalus* sp.) produced death in 48 minutes. The roots hashed up are used by native women to commit suicide. The method, as described by them, consists in placing small quantities in the nostrils, ears, armpits, and vagina; but in the one case which fell under my notice an emetic brought up generous quantities of the drug from the stomach. The roots when cut or bruised give off a strong odor of *Oleum gaultheriæ*.

TAMARISCINÆÆ.

Oluvili, *Tamarix articulata*, Vahl. Twigs pounded up raw and applied locally as a remedy for scabies.

MALVACEÆ.

Ocingombo, *Hibiscus esculentus*, L. The mucilaginous juice of the half-ripe pods is dissolved in water by gentle heat and drunk as a demulcent in coughs.

Ukua, *Adansonia digitata*, Juss. This tree is usually found just outside the district in which I made this study, but as the natives procure and use its fruit, etc.,

I include it here. A decoction of the seeds is drunk after fevers as a tonic stimulant. The pulp of the fruit is also eaten raw to cure diarrhea.

Utele, *Gossypium* sp. Smoke of leaves inhaled as a



Fig. 2.—*Tamarix articulata*, Vahl.

remedy for headache. The leaves are also dried by the fire and the odor inhaled for coryza.

STERCULIACEÆ.

Ocitutu, *Xeropetalum cuanzensis*, Welw. In case of childbirth with retained placenta the vulva is bathed



Fig. 3.—West African *Malvaceæ* growing in a swamp.

with a decoction of the leaves. It is also thought to be good in cases of edema of the external genitals.

BURSERACEÆ.

Umhafu, *Caranarium edule*, Hook. f. The habitat of this tree, like *A. digitata*, lies, strictly speaking, without the region under consideration, but since the products of the tree are used by the natives I have observed, I include the following note. The resin is applied as a balsam to sores and ulcers, and its inhaled perfume is said to relieve headache and accelerate difficult childbirth. The oil is esteemed as an application for strains and bruises. The powdered bark is also sometimes used in the treatment of ulcers. The seeds are often worn round the neck as charms.

DODONACEÆ.

Utola, *Ptaeroxylon utile*, E. et Z. Leaves chewed up and placed around joints to relieve malarial pains. Bark scraped fine and applied in the same way.



Fig. 4.—*Adansonia digitata*, Juss.

ANACARDIACEÆ.

Ohumbi, *Odina acida*, Welw. Bark pounded up, boiled, and applied to freshly made wounds.

Usondanduva, *Pseudospondias microcarpa*, Engl. Powdered bark snuffed up the nostrils in case of epistaxis.

LEGUMINOSÆ.

Onjilasonde, *Pterocarpus erinaceus*, Poir. In case of neuralgias and muscular pains, the skin is scarified and the inner bark of the tree hashed up and boiled is applied. The bark is very astringent and is used by the Boers for tanning leather. The gum which exudes when the tree is cut into, closely resembles the gum kino of commerce.

Ohula, *P. tinctorius*, Welw. Juice of bark given to babies who refuse to eat when being weaned.

Omanda, *Bertinia paniculata*, Benth. Steam from infusion of bark used, along with various fetish ceremonies, in the treatment of nervous disorders.

Omue, *B. angolensis*, Welw. The bark is pounded up, boiled, and the mess taken internally for diarrhea.

Okalembe, *Tephrosia vogelii*, Hook. f. An extract of the leaves is used (just in what manner I cannot learn) in the treatment of obscure diseases, accompanied by



Fig. 5.—*Pterocarpus erinaceus*, Poir.

dropsy. This is the shrub which is used to poison fish in rivers and streams. It is also mixed with food and employed to kill enemies.

Okapilingau, *Burkea africana*, Hook. The bark,



Fig. 6.—*Berlinia paniculata*, Benth.

macerated in a little water, is inserted by the women in the vagina as an aphrodisiac. Water in which the bark has been soaked is held to be valuable medicine for

hematuria from bilharziosis or other cause. Used in different ways, it is a favorite remedy for sexual disorders.

Ombambu, *Erythrophloeum guinense*, Don. The bark is used for some types of heart disease, but I have not been able to get details. This is the tree which furnishes the principal ingredient in the poison test of the negroes throughout tropic Africa. The bark, which in small doses produces vomiting and purging, has been tested physiologically. If powdered and inhaled it causes sneezing. The aqueous extract when injected under the skin of animals produces vomiting, irritates, and finally paralyzes the vagus nerve, causing the heart to slow, and, in larger doses, to stop.

Fig. 7.—*Berlinia angolensis*, Welw.

The limbs seem to become paralyzed before death as the victims of the poison test fall to the ground shortly after drinking the mixture. As I have fully described in another publication the manner in which this extraordinary custom is carried on, I shall not repeat it here.



Fig. 8.—*Burkea africana*, Hook.

Ocati, *Cassia occidentalis*, L. Roots boiled in water and the decoction administered as an anthelmintic.

Ososo, *Ehntada abyosinica*, Stend. Leaves pounded up and applied raw to limbs swollen from any cause, but

generally attributed to witchcraft. The ashes from the burnt leaves are applied to the umbilicus of newborn children.

Usonge, *Albizia anthelmintica*, A. Brogn. Generally esteemed a specific for the diseases of domestic animals (dogs, etc.). The roots are also boiled to make a mouth wash for ulceration of the gums, sinuses from decayed teeth, etc. It is also used in some way I cannot learn for headache and neuralgia.

Okangato, *Acacia reficiens*, Wawra. Leaflets boiled with salt and given for dysentery.

ROSACEÆ.

Usia, *Paranarium mobola*, Oliv. The bark is employed in debility from any cause as a stimulant and



Fig. 9.—*Paranarium mobola*, Oliver.

tonic. The usual method is to boil the bark and inhale the steam.

MYRTACEÆ.

Ongayawa, *Psidium* sp. Infusion of leaves employed as an internal astringent in diarrhea. Green fruit eaten for same purpose.

Ulembaputu, *Eucalyptus* sps. Decoction of leaves drunk by natives for intermittent fever.

COMBRETACEÆ.

Ungolo, *Terminalia angolensis*, Welw. Inner bark of roots considered a remedy for diarrhea.

RUBIACEÆ.

Ocilavi, *Gardenia jovis-tonantis*, Hiern. Bark sometimes used as a bitter tonic. As its names implies, it is believed to be a charm against lightning.

VERBENACEÆ.

Usilusilu, *Vitex* sp. The leaves are boiled, pounded, and applied to the abdomen for colic. The plant is also used in some form to treat conjunctivitis.

LABIATÆ.

Ondembi, *Acolanthus* sp. Applied as a stimulating poultice in anemia and cachexia.

Okatetembula, *Tinnea antiscorbuta*, Welw. This name was first given me for a mint (*T. antiscorbuta*), the

leaves of which are boiled in water and used as a mouth wash, but in another part of the country the term



Fig. 10.—*Gardenia jovis-tonantis*, Hiern.

“Okatetembula” is used to indicate *Uapaca benguelensis*, q. v.

COMPOSITÆ.

Ocisekua, *Turchonanthus camphoratus*, L. Used in malarial fever. Bark ground up and drunk in decoction and odor inhaled.

Kayeelindi, *Calendula*, sp. Leaves boiled and applied as a poultice to strains, bruises, etc.

PLUMBAGINACEÆ.

Nakanganga, *Plumbago zeylanica*, L. The roots are applied to the skin as a blister, and small quantities are also placed in the cavities of decayed teeth to destroy the nerve. In Bihé the name “Nakanganga” is applied to a small leguminous shrub which I have never seen described. It is very poisonous, and I know of one instance in which a man accidentally killed his child by the administration of a small quantity of the leaves (mistaken for another plant) steeped in water.

EBENACEÆ.

Owelele, *Maba mualala*, Welw. Infusion of leaves and twigs used as an anthelmintic.

APOCYNACEÆ.

Ocimbinga, *Strophanthus* sp. The milky juice (which was formerly used to poison arrow heads) is applied to sores. The fresh exudation from the roots is used.

LOGANIACEÆ.

Upole, *Strychnos* sp. Roots boiled, mixed with maize or millet beer and drunk for pains in the bowels.

CONVOLVULACEÆ.

Olucatu, *Cuscuta* sp. Used for muscular pains. Boiled and drunk; also applied locally.

SOLANACEÆ.

Alulangué, *Atropa* sp. The fruit pounded up and mixed with salt is applied locally for the "goat itch," which kills goats unless treated. The fruit is also cut in two and applied to the body in case of severe pain in persons suffering from malaria.

Olundungu, *Capsicum* sp. Sometimes given to expel worms.

Ekaya, *Nicotiana tabacum*, L. Is almost universally used either smoked or in the form of snuff. It is never chewed. Medically it is put on cuts and fresh wounds and the roots used in the treatment of trachoma.

CHENOPODIACEÆ.

Etiambulu, *Chenopodium ambrosioides*, L. This is the great panacea of the partially civilized blacks and half castes. Boiled and drunk for headache, pains in the chest, stomach, etc., also for worms and various ailments. The bush natives are coming to use it more than formerly.

EUPHORBIACEÆ.

Omolo, *Ricinus communis*, Müll. The oil is used in the treatment of "ukau," a skin disease resembling eczema. The leaves are pounded up and inserted in the vagina to make a retained placenta come away.

Osoma, *Euphorbia rhipsaloides*, Welw. The milky juice mixed with water is taken as a demulcent and expectorant in chest diseases. The terminal joints of the branches are also eaten raw for the same purpose.

Ocimbolo, *Jatropha curcas*, L. Seeds chewed up and swallowed as a purgative.

Ombula, *Uapaca benguellensis*, Müll. Infusion of bark and leaves used for nosebleed, being snuffed into the nostrils and held in the mouth. Also as a mouth wash for ulceration of the gums. Diarrhea is likewise



Fig. 11.—*Uapaca benguellensis*, Müll.

said to be cured by it, the infusion being drunk for this purpose.

CANNABINEÆ.

Epangué, *Cannabis sativa*, L. Hemp smoking is common. Medically the effects are held to be those of a tonic.

ARTOCARPEÆ.

Ulemba, *Ficus psilopoga*, Welw. The leaves and bark are made into poultices for pains of almost any description.

Ukuyu, *F. mucoso*, Welw. Different parts of this



Fig. 12.—*Ficus psilopoga*, Welw.

tree are used as ingredients in mixtures used to treat various complaints supposed to be due to witchcraft.

MONOCOTYLEDONS, GRAMINEÆ.

Owangu. This is a general name for grass. Species of *Eragrostis*, *Setaria*, and *Phyllorachis*, which are used in women's diseases, but more especially in fetish rites. A coarse grass (which I am unable to determine), called "Ohotahota," is burned and the smoke inhaled for headache. A grass of which I have not seen the flower or fruit, is used in stomach troubles. The root is the part employed. I have also had specimens near *Panicum* and *Paspalum* brought to me, but with very vague information as to their medical uses. Grasses being difficult to recognize, the above list is by no means complete.

CYPERACEÆ.

Osoka, *Cyperus* sp. Roots eaten raw as an anthelmintic.

Ocimbu, *Papyrus antiquorum*, L. Ashes mixed with other medicines to increase their efficiency. Several other sedges are used in witchcraft and fetish rites.

LILIACEÆ.

Ocandala, *Aloe* sps. The thick, fleshy leaves are chewed and swallowed to produce catharsis after over-eating, and the juice is also employed in the treatment of sores.

Onjelele, *Asparagus* sp. (? *racemosus*). Supposed to be a strengthening application to the body in cachexia.

Ombungululu, *A. africanus*. Infusion drunk to cure pains in the chest.

AROIDEÆ.

Evongevonge, *Richardia africana*. Leaves and flowers mashed up and applied to paralyzed limbs.



Fig. 13.—*Richardia africana* growing in swamp.

PALMACEÆ.

Ondende, *Elaeis guinensis*. The oil is applied to sores.

Ocissime, *Metroxylon* sp. Is used medically, but just how I cannot learn.

CORYPHINÆÆ.

Okasalala, *Phoenix spinosa*. Ashes used in treating weakness of old age.

IRIDACEÆ.

Sipesipe, *Gladiolus* sp. Roots boiled, mixed with meal, and taken for cystitis or any other bladder trouble.

BROMELIACEÆ.

Ociteke, *Amomum* sp. Seeds eaten for abdominal pains.

Ovomomis, *Costus* sp. Used same as preceding.

SCITAMINÆÆ.

Ucalo, *Canna* sp. Used same as two preceding.

CRYPTOGAMIA, POLYPODIACEÆ.

Ocinjamba, *Polypodium* sp. Boiled and steam used as vapor bath in hyperpyrexia.

OPHIOGLOSSACEÆ.

Ocinyene. Roots used like ergot to hasten childbirth or procure abortion.

Ocusitu, *Adiantum* sp. Used like foregoing.

A glance at the preceding review shows (1) the bush natives of west Africa use a large variety of plants as medicines; (2) as a rule they have a separate remedy for each disease; (3) their internal remedies are almost exclusively administered in the form of decoctions or infusions; (4) they have faith in many inert substances. The study of the plants used by a savage people like

those here observed throws an interesting sidelight on the evolution of materia medica and therapeutics.

A study of this kind must necessarily always remain incomplete. Since writing most of the foregoing notes, a sedge, a mint, two fungi, an orchid, an alga, a species of *Spondias*, several *Umbelliferae*, and three additional *Compositae*, all purporting to possess medicinal virtues, have been brought to me. These, with other new material, I hope to discuss at some future time. Only a few of the diagnoses of the plants mentioned in the fore-



Fig. 14.—*Cannas* growing in jungle.

going list have been confirmed by specialists, but I hope the errors found will be inconsiderable.

The illustrations are from photographs taken especially for this paper by Mr. W. E. Fay, B.A., with the exception of Figs. 3, 12, 13, and 14, which are from photographs kindly given to me by Mrs. E. D. Woodside.

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Extremely Long Pregnancy.—J. Arthur Lamb gives an account of a case of pregnancy which lasted, dating from the last menstruation, 339 days; and dating from the last coition, 313 days. These data seem to be well fixed. The cause attributed by him was a cranial deformity of the fetus, interfering with prompt natural delivery, the exact nature of which is not stated, though it is said that the brain was exposed, giving the suggestion of a breech presentation. It would have been interesting, he remarks, to have known how long this case would have gone had not quinin been given to cause uterine contractions.—*Journal A. M. A.*

ETIOLOGY, SYMPTOMATOLOGY, AND TREATMENT
OF ANAL FISSURE.¹

BY

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A typical anal fissure may be described as a linear ulcer at the mucocutaneous junction of the anus, giving rise to intense suffering on defecation. It is usually situated just within the verge of the anus, at or near the posterior commissure, but may occur within the inner surface of the external sphincter and may be located at any part of the anus. A fissure situated anteriorly is more often encountered in women, owing to the fact that the overstretched condition of mucous membrane of the anus is apt to tear during parturition and leave behind one or more slits or clefts, the so-called fissure or irritable ulcer of the anus. The passage of hard feces over the delicate mucous membrane may readily cause a tear.

It is possible also that the constant presence of a dry mass of feces in habitual constipation interferes with the secretion of the glands of the rectum, rendering the mucous membrane dry and inelastic, and therefore more liable to be lacerated during its passage through the anal orifice.

Beside constipation, fissure may be due to congenital narrowing of the anus, eczema, and herpes ani, foreign bodies which have been swallowed and passed through the rectum, polypus, uterine displacements, dysentery, syphilis, and the tuberculous diathesis. Occasionally fissure is met in patients who have practised pederasty or rectal masturbation. The frequent and careless introduction of the syringe nozzle when giving enemas may also induce a fissure in ano. Quenu and Hartman believe that a tendency to piles is the real cause of fissure. Boyer, on the other hand, considers the spasmodic contraction of the sphincter muscle the cause of the disease. Ball, of Dublin, is of the opinion that the majority of fissures are produced by the tearing down, during a hard passage, of the lateral attachments of one of the valves of Morgagni, which can be demonstrated at the lower end of the fissure as a hypertrophied and edematous fold of skin, constituting the so-called sentinel pile. It is true that this condition is found in some cases, but I failed to find it in the majority of cases. It is therefore evident that fissures are the result of tearing of any part of the mucosa. Fissure is an affection of adult life, but may also occur in children. I have seen several cases in young children. Allingham, Curling, Mathews, Quenu, and Hartman mention cases in infants in arms. Recently I saw such a case with Dr. Hofkin, in a child of about 18 months, in which two fissures were present. Jacobi thinks fissure of the anus a much more common affection in children than is generally supposed, and believes that many fretful children who sleep badly and cry constantly, and often present symptoms simulating those of vesical calculus, really suffer from fissure of the anus. Fissure is probably more frequent in females than in males. This is probably due to the fact that the

former are more apt to lead sedentary and indoor lives, and are therefore more prone to suffer from constipation, which is, beyond doubt, the main cause of fissure. Furthermore, parturition has some influence in its causation.

Symptoms: It is safe to say that no other wound inflicted upon a person produces such intense suffering and reflex manifestations as a typical fissure.

I have seen men and women entirely incapacitated by this insignificant lesion. The pain during and for some time after a stool is so severe that patients will, as a rule, defer the act of defecation for days and in some instances for weeks in order to escape it. In the early stage of the disease, pain is not so severe and does not last long, but as the wound is irritated, and perhaps further torn by each passage, the pain increases in severity and duration. The patient now complains of a burning, shooting, and throbbing sensation within the anus, accompanied by an intense itching. The pain may persist for one-half hour to six hours or longer, after the act of defecation. The exposed nerve filament in the floor of the fissure calls forth undue and excessive action of the sphincter, and this spasm by compressing the wound aggravates the pain.

The stool may contain a few drops of blood, especially when the actual tearing takes place, but profuse hemorrhage is a rare occurrence, unless complicated by piles. Occasionally a slight discharge of mucus or pus is noticeable. Pruritus is one of the most annoying symptoms, and is sometimes more difficult to endure than the sphincteralgia. The patient when asked to force the anus outward will find it impossible to do so, owing to the spasmodic contraction of the sphincter and the levator ani. Flatulence is present in nearly all cases for the same reason. Often marked reflex symptoms are noticeable. The patient complains of pains in the loin over the crest of the ilium and sacrum, and down the backs of the thighs and calves, and this is frequently mistaken for sciatica. Occasionally attacks of retention of urine are present as a reflex accompaniment of anal fissure.

Pain in the uterus, vagina, ovaries, and prostate is sometimes observed. To sum up, the most characteristic symptoms of anal fissure are: pain or irritation of the anus and paroxysmal contraction of the sphincters. While these symptoms may be considered as pathognomonic of the disease, it is well to remember that without a local examination, comprising inspection and a digital exploration, it is not possible to reach a correct conclusion. The following case will show the absolute necessity of a local examination:

CASE.—B. C., aged 28, barber by occupation, came to my office complaining of pain in the rectum during and for some time after defecation; he also saw blood in his stool and suffered from constipation. He had consulted a physician, who told him he had bleeding piles and treated him for that condition for about two months.

In spite of treatment he grew gradually worse. The symptoms presented the characteristic symptoms of fissure, and an examination revealed the presence of an abrasion just within the grasp of the external sphincter. A complete cure was effected by forcible divulsion.

A digital examination is always required to ascertain whether or not there are other morbid conditions com-

¹ Read before the Northern Medical Association, February 24, 1905.

plicating the fissure. The following conditions are often encountered in conjunction with fissure: polypoid growths, piles, blind internal fistula, and submucous abscess. Not much pain is caused by the passage of the finger into the rectum if gently introduced and passed well against the opposite side from where the fissure is located.

The recognition of such complications is very important, because, unless they are removed simultaneously when the fissure is operated upon, the healing will be much slower and a permanent cure improbable. The treatment is, as a rule, divided into the palliative and the operative. The palliative treatment is sufficient in most cases. It consists of measures for preventing constipation, observation of local cleanliness, and local applications to the ulcer. As constipation is the exciting cause of fissure in the vast majority of cases, we must endeavor to regulate the bowels and secure at least, once in 24 hours, a soft motion. This can be best accomplished by the administration of the fluid extract of *cascara sagrada* at bedtime.

In cases of obstinate constipation, saline cathartics are indicated; drastics, however, should never be employed. The injection of two ounces of olive oil at bedtime to be retained all night has an excellent local effect. The daily application to the ulcer of a .65 gm. (10 gr.) solution of silver nitrate or a 20% solution of ichthyol and an ointment containing opium and belladonna may be followed by a cure in cases of uncomplicated fissure, when the ulcer is small and not deep, and when there is no marked sphincter spasm present. If these measures fail, cauterization should be resorted to. A 20% solution of cocaine should be applied directly to the ulcer on a pledget of cotton, to reduce the pain accompanying and following this procedure, and the fissure is then thoroughly cauterized either with the electric or Paquelin cautery-point or with the solid stick of silver nitrate, or carbolic acid. I like the electric cautery knife and always employ it in preference. The operative treatment is the surest and quickest method of cure. Complicated cases of fissure and even simple ones, when there is much spasm of the sphincter, should be operated upon as soon as possible. There are several methods practised for the operative treatment of fissure, but all have the same object in view, namely, the causation of a temporary paralysis of the sphincter, placing the ulcer to rest until repair can take place. Stretching of the sphincter with incision of the ulcer or the so-called Boyer's operation is commonly practised by English surgeons.

The French surgeons, on the other hand, practise stretching of the sphincter without incision of the ulcer—Recamier's operation. Gradual dilation may be practised when the patient refuses to take a general anesthetic, or when there is any contraindication to the administration of an anesthetic. This may be done with the fingers or with anal dilators. Local anesthesia is required for this form of divulsion. Forcible dilation, however, under general anesthesia, is the best method. This can readily be done under nitrous oxid anesthesia. The method of operation I employ is divulsion with incision, trimming at the same time the indurated

margin of the wound, and curetting the base. The after-treatment consists in keeping the bowels confined for three days, and after this time daily movements are secured by laxatives. The ulcer usually heals in about two weeks.

In conclusion, I would emphasize that a local examination is indispensable in a case of suspected fissure. It is better to refuse to treat patients who, from motives of delicacy decline a local examination, than to commit yourself to possible errors.

BRIEFS ON GENITOURINARY SURGERY.

The Diagnosis of Incipient Genitourinary Tuberculosis.

BY

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There is a marked parallelism in the difficulties and methods—to say nothing of the necessity—of an early diagnosis in pulmonary and renal tuberculosis. It is generally accepted that in by far the larger proportion of cases of tuberculosis affecting the genitourinary tract, tubercle bacilli are not discoverable in the urine until pronounced invasion of the tissues, and a certain amount of breaking down have occurred. This being the accepted idea, it is obvious that in very many instances the golden opportunity for successful treatment is lost. We can imagine how disastrous it would be for the welfare of our patients were it only possible to make a diagnosis in pulmonary tuberculosis after breaking down of lung tissue has occurred.

Clinical experience has convinced me that greater care in diagnostic methods will enable us to discover genitourinary tuberculosis in its incipency much more frequently than is ordinarily supposed. The point which I desire to make will be best illustrated by several cases that have come under my observation:

CASE I.—A man of 30 was under treatment for urethral hemorrhages and hematuria, apparently due to a congested, moderately tight, bulbomembranous stricture. There were symptoms of chronic vesical infection, but the cystoscope showed no changes in the bladder wall, nor did the prostatescope reveal anything more than a congested prostatic urethra. The prostate was slightly enlarged and sensitive, but there was no obstruction to urination. The urine was persistently turbid, and at times contained a small quantity of pus. Micturition was frequent and painful. Temperature and pulse were normal. The patient's general condition was excellent, although his habits were extremely bad, as he was addicted to drink and dissipation of various kinds, and was a subject difficult to control. The obstinacy of the vesical symptoms, which persisted after a fair degree of dilation of the stricture had been attained, led me to suspect that something more serious than a simple cystitis from postgonorrheal infection existed. Careful microscopic examinations of the centrifuged urine made at varying intervals for a period of about six weeks, failed to show any findings other than those found in the ordinary cystitis coincidental with stricture following chronic gonorrhea. Inoculation of a guinea pig with the urine was resorted to, with the result that in six weeks the animal developed distinct tuberculosis, both in the lymphatic glands and at the site of the inoculation.

Tuberculin was afterward used in this case, combined with vesical instillations of iodoform, ether and albolene. All of the symptoms disappeared, and the patient has remained in perfect health, with the exception that the urine is a little turbid from time to time.

Some time after the diagnosis was established by the guineapig test, bacilli were found in the urine, and although improvement was rapid and steady, the bacilli remained, and were found for a whole year after the patient was symptomatically well, with the exception of the cloudy urine. The patient has remained in excellent condition for the last two years, despite the fact that he has persisted in his old habits. No examinations of the urine have been made in two years, because of the indifference of the patient.

CASE II.—A young man of 28 was referred to me for operation for stone in the left kidney. The history of the case was very brief. The patient was in excellent health and had been all his life. For several years prior to consulting me he had had at intervals of a few months, attacks of renal colic, localized on the left side, attended by hematuria. On several occasions clot casts of the ureter were expelled. During the intervals between the attacks of hematuria the patient was perfectly well, save occasional lameness, tenderness, and slight pain in the vicinity of the left kidney, as he expressed it, "some of the time he knew that he had a kidney, and at other times he was unconscious of the fact." The temperature and pulse were normal. There was absolutely no perversion of general nutrition so far as I could determine. The appetite was good. The patient could do a fair amount of work as a clerk in a store. The finding of the röntgen ray was negative. The urine, while it contained a somewhat larger quantity of leukocytes than is usual, was otherwise absolutely normal, macroscopically, microscopically, and chemically. Repeated examinations of the urine showed bacilli to be absent. The guineapig test was made in this case, and up to the seventh week after the inoculation of the animal the result was apparently negative. At the end of that time a nodule appeared at the point of inoculation, and the inguinal lymphatic glands showed a distinct enlargement. The microscope proved conclusively the process in the guineapig to be tuberculous. The patient in this case is still under observation and remains in about the same condition as when first seen. He is at present making arrangements for a change of climate, which, considering the incipency of the tuberculous infection, may reasonably be expected to effect a cure. I shall certainly not consider operative interference until climatic influences have had a fair chance.

CASE III.—A young woman of 20 had been troubled with backache and frequent micturition, with occasional hematuria for six months. General nutrition was impaired, the patient having lost considerable weight, and the appetite being poor. There was, however, no elevation of temperature. The urine contained pus and blood in small amounts, but was otherwise normal. There was not sufficient of the corpuscular ingredients to impair the clearness of the fluid. Cystoscopy showed no change of the mucous membrane of the bladder, and the urethra was apparently normal. Inoculation with tuberculin gave the characteristic reaction, and the guineapig test gave positive results.

A diagnosis of incipient renal tuberculosis was made in this case. Treatment by tuberculin was not only not beneficial, but apparently detrimental. Change of climate was suggested, and the patient went to Arizona, where she apparently recovered completely. Two years later she returned to her home in the East, and has since remained apparently well.

The foregoing histories are illustrative of a class of cases in which only too frequently the diagnosis is overlooked until very little hope of benefit can be offered by the physician. It goes without saying that it is our duty to make a diagnosis as early as possible, and if, in order to make an accurate diagnosis, the means employed in the foregoing cases are necessary, they should be undertaken at once.

ECTOPIC GESTATION.¹

BY

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Extrauterine pregnancy occurs much more frequently than is generally recognized. There are three varieties: Tubouterine, or interstitial; tubal; and tuboovarian. There have been a few cases of ovarian pregnancy reported. In regard to the etiology of ectopic gestation, it is common after long periods of sterility. This is probably owing to the fact that the sterility may have been due to chronic salpingitis, which, by a thickening of the tube and destruction of the cilia, prevents the normal passage of the ovum to the uterus and favors its implantation in the tube. Peritoneal adhesions and bands which obstruct the tube are also causes of ectopic gestation. Ectopic pregnancy has been found coincidentally with pus in the tube on the opposite side.

Tubal pregnancy is not infrequent. In 3,500 general autopsies, Formad found 35 ectopic pregnancies, or 1%. Abdominal surgery has revealed many cases of tubal gestation which otherwise would have remained unrecognized, and it has thereby added to our estimate of its frequency. Many persons are said to die each year in Philadelphia of "so-called heart disease" and other causes, when in reality the death is due to internal hemorrhage from ectopic gestation. Repetition of tubal pregnancy has been noted on several occasions. Both tubes may be simultaneously pregnant. Twin pregnancies have been reported, and Sanger and Krusen have reported cases of triple ectopic gestation.

In regard to the pathology of this condition, the ovum, which ordinarily passes into the uterus after impregnation, attaches itself to the tubal wall and continues to develop there. Naturally the conditions here are not so favorable as in normal gestation, and the tube soon becomes extravascular, thinner, and in most cases there is less and less resistance and a predisposition to rupture.

The tube may rupture in one of four directions: (1) Into the abdominal cavity; (2) into the folds of the broad ligament; (3) into the space formed by adhesion between the tube and the ovary; (4) into the uterus in cases of the tubouterine variety. Occasionally, tubal abortion occurs when the abdominal ostium of the tube is still open and the product of conception is discharged into the abdominal cavity. Rupture of the tube may occur at any period, and usually it takes place at the point of placental insertion. This rupture may be due

¹ Read before the Association of Ex-resident and Resident Physicians of the Jewish Hospital, October 2, 1905.

to direct tension on the tubal walls from the growing fetus; from mechanical violence, from falling, lifting or jumping, and from coition. A digital examination may be the direct cause of the rupture. If the rupture occurs early in pregnancy, the hemorrhage may be less severe; and if it is slight, we have the formation of a retro-uterine hematocele, which is generally encysted and gradually absorbed and often not recognized until some subsequent abdominal operation.

The symptoms of tubal pregnancy resemble those of normal gestation. The usual signs, such as pigmentation, fulness of the breasts, morning nausea, may be present or absent; slight uterine hemorrhage may occur at irregular intervals. Colicky pains, probably due to uterine contractions, appear toward the end of the second month. The patient usually suffers more discomfort than in previous pregnancies. On a careful bimanual examination, the uterus is found enlarged with a mass on one side or the other, which may be mistaken for disease of the appendages. The uterus is much smaller than is usually expected from the duration of the pregnancy. According to Hofmeier, the pulsation of the artery on one side of the cervix, and not upon the other, is a valuable sign of extrauterine pregnancy.

The diagnosis of extrauterine pregnancy before rupture is rarely made, because the patient does not usually consult her physician. The diagnosis of this condition depends upon the following symptoms: 1. A history of early pregnancy. 2. A paroxysm of frightful pain, usually upon one side. 3. Sudden collapse, often with fainting. 4. Symptoms of internal hemorrhage, rapid, weak pulse, facial pallor, air hunger, and all the symptoms of loss of blood. 5. Later, abdominal tenderness and distention.

Vaginal examination will present the physical signs of effusion into the peritoneal cavity. In cases of doubt as to the diagnosis, a small vaginal incision may be made through the posterior vaginal vault, when the escape of free blood will verify the diagnosis.

The symptoms of ruptured ectopic gestation have been closely simulated by the rupture of varicose veins in the broad ligament; by the rupture of an ovarian cyst or the torsion of its pedicle; or by a criminal abortion with perforation of the uterus in a case in which a false history is purposely given; or by pelvic tumors associated with intrauterine pregnancy. But as all these cases require abdominal treatment, a mistaken diagnosis is of little importance, because abdominal section gives an opportunity for proper treatment. A very frequent error which occurs in general practice is to mistake an extrauterine pregnancy for incomplete abortion.

Prognosis.—Without surgical treatment about two-thirds of the patients die, the remaining third escape the immediate danger of death. This statement is verified by Winkel in whose series of 265 cases, the patients in whom surgical treatment was not adopted 36.9% recovered and 63.1% died. Of those who do not die directly in consequence of tubal gestation, a large proportion remain chronic invalids as the result of various complications. In another series of 278 cases, in which there was no operation, collected by Schauta, Martin, and Orthmann,

187 patients or a little over two-thirds died; while of 636 patients operated upon, 507, or 80% survived. Therefore so soon as the diagnosis is established with reasonable certainty, whether before rupture or after, abdominal section is the only treatment worthy of consideration. The use of electricity, and of injection into, or puncture of the sac, are discarded procedures; and the removal of the sac and control of hemorrhage is the only plan justifiable. After rupture the patient's only salvation is immediate celiotomy, evacuation of the blood from the peritoneal cavity, the ligation of the bloodvessel supplying the sac, and its complete removal.

This operation is often performed in a hurried manner, but time should be taken to secure absolute aseptic conditions of the field of operation, of the surgeon, assistants and instruments. As little anesthesia should be used as is possible and stimulation should be withheld until the bleeding-point is secured. When the abdominal incision is made, no attention should be paid to the enormous quantity of blood that gushes forth, but the operator should place his hand directly upon the ruptured tube and clamp the bleeding parts. As soon as the bleeding-point is grasped, vigorous stimulation may be employed. The ruptured appendage should be removed after the broad ligament has been ligated *en masse*. The blood clots may be rapidly ladled out and the pelvic cavity quickly flushed with a large quantity of sterile saline solution. A quantity of the fluid may be allowed to remain in the pelvic cavity. Drainage is rarely necessary, in fact is rather detrimental.

For the first few hours after the operation active stimulation and treatment for the acute anemia is necessary. Hypodermoclysis, and intravenous injection of normal salt solution are invaluable. If the patient is not seen until after a hematocele has formed, a vaginal incision may be made with the evacuation of the clots which lie in large quantities in the pelvic cavity; but the patient should be prepared for the abdominal operation should it prove necessary because of the recurrence of hemorrhage. In some cases of intraligamentary pregnancy, it is possible to open the sac extraperitoneally by an incision above Poupart's ligament, but as a safe all-round procedure which permits a nicety and precision of work, the abdominal section is best.

DIABETIC PURPURA.¹

BY

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On April 1, 1903, Dr. Edwin E. Graham referred the patient with this interesting case to the Children's Out-patient Department of the Jefferson Hospital.

Robert M., aged 3, was born with the aid of forceps, and was breast-fed for four months. Thereafter, mixed breast and bottle feeding was employed until the age of 1 year. Dentition occurred at the age of six months.

¹ Read at the meeting of the Philadelphia Pediatric Society, November 13, 1905.

The boy's father was healthy, but the mother complained of rheumatism and nervousness. The paternal grandfather died of tuberculosis, as did also an uncle on the mother's side. There are two other children living and healthy. No children have died, and there is no history of premature births.

The boy has not suffered from summer diarrhea nor any other disease incidental to early childhood. Three months ago a bluish eruption appeared on the body and face. The eruption occurred in irregular patches, varying in size from that of a silver quarter to a silver dollar, gradually fading from a dark blue or purplish color to greenish-yellow, and finally disappearing. Each lesion lasted from one to two weeks, and was followed by the appearance of new patches on other parts of the body.

From beginning to end they resembled the lesions that result from contusions.

There were also vesicles on the tongue, lips, and mucous surfaces of the cheeks, which bled readily. The appetite was poor, except for sweets; the tongue was coated; the bowels moved twice or three times a day, the stool being well formed, and dark brown in color. He urinated eight or nine times during the day and once during the night, occasionally soiling the clothing.

Urine varied in color, contained some sediment, and sometimes discolored the underclothing, but at all times had a pleasant odor.

On presentation, there was one purpuric patch on the angle of the right jaw, one over the right hip-joint, and one on the under surface of the scrotum and the perineum adjoining.

He was well nourished and favored with a beautiful cherry complexion. He was nervous and practised masturbation. He never had fever. Heart, lungs, liver, and spleen were found normal on physical examination.

No treatment was instituted until April 4, when a sample of urine was obtained and examined, with the following result:

Urine turbid, light amber color, pleasant odor, reaction highly acid, specific gravity 1,086, sediment flocculent, no albumin, sugar present, 11 gr. to the ounce. Under a strict diet of skimmed milk, improvement in the glycosuria was noted.

April 10: Urine clear, light amber color, pleasant odor, acid reaction, specific gravity 1,020, no sediment, no albumin, sugar present, 1 gr. to the ounce. Purpuric areas less distinct. Graham bread was added to the diet.

April 18: Urine clear, light amber color, acid reaction, specific gravity 1,022, no sediment. Slight reaction to Boettger's test. Fermentation test shows only a trace of sugar.

April 24: For the past four days the child has suffered from an attack of follicular tonsillitis. Purpuric spots yellowish. A more liberal antidiabetic dietary allowed. Atropin sulfate, 0.2 mg. ($\frac{1}{320}$ gr.) at 1 p.m., 4 p.m. and 7 p.m. for the enuresis.

April 29: Appetite ravenous, bowels regular, easily purged by fruit. Urinalysis shows a specific gravity of 1,022, and a trace of sugar. Atropin sulfate, 0.2 mg. ($\frac{1}{320}$ gr.) four times a day.

May 4: Appetite fair, bowels regular, gastric discomfort after eating meat; still urinates frequently, although has better control at night. Urine clear amber, specific gravity 1,024, acid, no albumin, a trace of sugar.

May 11: Condition about the same. Slight evidences of purpura remain. Tincture of belladonna, six drops three times a day.

May 23: No signs of purpura present. Does not soil his bed or clothing so frequently, and urinates less often. Negative reaction to Fehling's and Boettger's tests, and no difference in the specific gravity after fermentation. Tincture of belladonna, 7 drops three times a day.

May 30: Urinates three or four times a day, has good control at night. Diet is judicious. Boy active and in good condition.

June 4, 1904, one year later, the boy was pale and emaciated, the skin was dry and poorly nourished, but contained no marks of purpura. He presented the aspect of true diabetes. A hasty examination of the urine gave a positive reaction to Fehling's solution. The boy was then put in the care of the family physician for nine months and he is now comfortably healthy while on a judicious diet.

Purpura is characterized by an extravasation of blood into the superficial or deeper tissues. According to Marfan,¹ the causes of secondary purpura may be classified as: (1) Mechanical, traumatism or other causes altering intravascular or extravascular pressure; (2) nervous, in paralysis, sciatica, hysteria, deep emotion, or fright. Probably due, as S. Weir Mitchell asserts, to vasomotor relaxation or weakening of the walls of the bloodvessels; (3) toxic, forming a part of some of the infectious diseases, as hemorrhagic smallpox, scarlet fever, and measles. A symptom in such diseases as enteric fever, diphtheria, lobar pneumonia and bronchopneumonia, angina, vaccinia, infectious endocarditis. In gastrointestinal intoxications, severe jaundice, acute yellow atrophy of the liver. It may follow the ingestion of various vegetables and other articles of food. Purpura is found in cachetic diseases, tuberculosis, cancer, leukemia, pernicious anemia, pellagra, senile cachexia, diabetes, Bright's disease, Barlow's disease, and in hereditary syphilis. Purpura can be caused by various poisons, iodine, iodoform, potassium iodide, antipyrin, belladonna, arsenic, chloral, chloroform, alcohol, ergotin, phosphorus, quinin sulfate, salicylic acid, the balsams (copaiba, cubeb, santal oil, and turpentine), snake poison, and therapeutic serums.

Indeed, most writers and textbooks give diabetes as one of the causes of secondary purpura, but no report of such a case could be found. This case is, therefore, put on record as showing the coexistence of these two interesting disorders of metabolism. It is also interesting because it proves that a true diabetes mellitus may follow an alimentary glycosuria. Furthermore, it justifies Morse's injunction as to the importance of a routine examination of the urine in infancy and childhood. This patient had been treated previously for enuresis. From a moderate experience, I have become quite firmly convinced that if Morse's teaching was universally followed, enuresis as a disease entity would vanish from the textbooks and would occupy no time in our clinics. Moreover, the value of an examination of the urine in infancy and childhood, when metabolic processes are comparatively simple, cannot be overestimated.

I regret that the overcrowded condition of the old hospital prevented deeper pathologic investigation of the case, and that the report of one blood-examination made by Dr. John Funk was lost.

In conclusion, I desire to express my gratitude to Dr. Graham for referring the patient, and also to my colleague, Dr. Wm. E. Pole, for the urinalyses.

"The Archives of Physiologic Therapy."—The publishers announce that the printers' strike has delayed the December and January issues, and will also, in all probability, affect the February issue.

¹ Marfan: *Traite des Maladies de l'Enfance*, 1897, Vol. ii, p. 154.

SPECIAL ARTICLES

SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE.

Proceedings Reported by the Secretary.

WILLIAM J. GIES, PH.D.,

of New York.

The fourteenth meeting of the Society of Experimental Biology and Medicine was held in the Rockefeller Institute on Wednesday evening, December 20, 1905. The president, Edmund B. Wilson, was in the chair.

MEMBERS PRESENT.—Adler, Atkinson, Auer, Beebe, Brooks, Burton-Opitz, Calkins, Crampton, Davenport,¹ Dunham, Emerson, Ewing, Field, Flexner, Gibson, Gies, Hatcher, Jackson,¹ Levene, Levin, Lusk, A. R. Mandel, Meltzer, Morgan, Noguchi, Oertel, Opie, Pearce,¹ Salant, Shaffer, Wadsworth, Wallace, Wilson, Wolf, Wood.

MEMBERS ELECTED.—W. E. Castle, H. H. Donaldson, David L. Edsall, Thomas Flournoy, R. B. Gibson, Walter Jones, A. S. Loevenhart, John A. Mandel, Fritz Schwyzer, Frank P. Underhill, Francis C. Wood.

ABSTRACTS OF REPORTS OF ORIGINAL INVESTIGATIONS.²

"The action of eosin upon tetanus-toxin and tetanus:"

SIMON FLEXNER and HIDEYO NOGUCHI.

1. Eosin and certain other anilin dyes have the power of destroying in vitro the hemolytic property of tetanus-toxin.

2. Eosin, when used in sufficient quantity, destroys tetano-spasmin in vitro.

3. Simultaneous injection of tetanus-toxin and eosin into rats delays or prevents the appearance of the symptoms of tetanus. When the symptoms appear they progress more slowly than in control animals.

4. Spores of tetanus-bacilli when introduced on threads into rats, together with immediate eosin injections, do not produce tetanus. The treatment of animals with eosin, after the first appearance of the tetanic symptoms following spore-infection, may prevent the further developments of the symptoms of tetanus. Eosin injections into the same locality as spore inoculations are the most effective, but injections into other parts of the body delay or modify the tetanic process.

5. Rats are more resistant to tetanus than guinea-pigs, and hence are more easily protected by eosin from tetanus poison; but in guinea-pigs the fatal issue can be delayed by eosin.

"The action of eosin and erythrosin upon snake venom:" with demonstrations. HIDEYO NOGUCHI. (Communicated by Simon Flexner.)

1. The hemolytic principles of venom react differently to eosin, depending upon their native liabilities. The hemolysin of *Crotalus* venom suffers most; that of *Daboia* next, while that of *Cobra* is the most resistant.

2. The toxicity of different venoms is more or less diminished by eosin in the light. *Cobra* is least affected; *Crotalus* and *Daboia* venoms are most affected. *Crotalus*

venom loses its toxicity chiefly by destruction of hemorrhagin, and *Daboia* by destruction of coagulin.

3. Neurotoxin is little or not at all affected by eosin or erythrosin.

4. There is a parallel between the susceptibility of the toxic principles of snake venom to fluorescent anilins and to other injurious influences. Hemorrhagin and coagulin are less stable at high temperatures than neurotoxin, and more easily destroyed by acids than neurotoxin and hematoxin.

"On decomposition of purin bodies by animal tissues:"

P. A. LEVENE and W. A. BEATTY.

The authors aimed in this work to study the products of decomposition of purin bodies in the tissues. Jones, Schittelhelm, and Levene have observed that aminopurins are transformed into oxypurins. It is well known that purin bodies undergo complete destruction in the course of tissue autolysis.

The authors have studied the conditions most favorable for the process of purin decomposition by animal tissues, and have endeavored to ascertain the general nature of the substances formed during the process. It was found that the presence of 0.5% of sodium carbonate in mixtures of spleen, pulp facilitated the decomposition of purin bodies to such an extent that even uric acid is broken up by that tissue. It was also noticed that the decomposition products were nonbasic in nature, for they were not precipitated by phosphotungstic acid. On decomposition of uric acid by tissue extracts, formation of ammonia could not be detected.

"On the biologic relationship of nucleoproteid, amyloid, and mucoid:"

P. A. LEVENE and JOHN A. MANDEL.

The authors endeavored to ascertain the nature of the carbohydrate groups in the protein molecule. It was found that by heating nucleoproteid on a water bath with a 5% solution of sulfuric acid, a product could be obtained that had the properties of a polysaccharid or of a glucosid, and which contained in its molecule a small proportion of sulfuric acid (S=0.5%). On treating nucleoproteids with alkali, substances were obtained containing a much greater proportion of sulfuric acid (S=3.5%; N=8.8%). The substances thus obtained were found to possess the properties of glucothionic acids containing small quantities of nucleic acid.

Glucothionic acid has hitherto been recognized as a constituent of mucoid and amyloid. The results of this investigation place the three groups of substances in genetic relationship.

"Imperfection of Mendelian dominance in poultry hybrids:" with demonstrations of photographs and plumage-charts. C. B. DAVENPORT.

According to the Mendelian formula one of the pair of characters that are opposed in hybridization dominates over the other, occluding it; the dominated, or recessive, character reappears in its pristine purity when the hybrids are interbred.

A careful examination of the facts shows that in poultry hybrids the dominant character is frequently modified by the presence of the recessive and in the direction of the latter. For example, white plumage color may dominate over black, but the white hybrid shows some black feathers; white dominates over buff

¹ Nonresident.

² The authors of the communications have written the abstracts. The secretary has made occasional abbreviations in some of them.

plumage, but the hybrids have a buff cast. Pea comb is dominant over single, but the middle lobe of the hybrids is unusually high. Narrow nostril is dominant over the high nostril of the Polish fowl, but the hybrid nostril is exceptionally wide. When the hybrids are interbred the recessive character reappears in about one-fourth of the hybrids, but often so modified as to be scarcely recognizable. The gorgeous bright red and golden but recessive plumage of the Japanese long-tailed fowl reappears in the second hybrid generation as a dull brick red, much mottled with black. The fact of the mutual contamination of characters in hybrids justifies the warnings given by breeders as to loss of characters in hybridization, and the care that they exercise to maintain pure races.

"*The mechanism of conduction and coordination in the heart with special reference to the heart of Limulus.*"

A. J. CARLSON (Presented by RUSSELL BURTON-OPITZ).

I. *The Rate of Conduction.*—It is advocated, chiefly by Engelmann, that the rate of conduction of the impulse in the heart is too low (20 cm. to 30 cm. per sec. in the frog; 2 m. to 4 m. per sec. in the dog) to take place in the nervous tissue. The slow conduction in the heart is thus construed as an argument in favor of the myogenic theory. This is based on the erroneous assumption that all nervous paths in the same animal conduct with the same, or practically the same, rapidity. The author has shown that this is not the case even for the motor nerves to the striated muscles. On the contrary the rate of conduction in the nerve stands in direct relation to the rapidity of contraction of the muscle supplied by the nerve.¹ On this principle one would expect the rate of conduction in the intrinsic nervous plexuses of the alimentary tract and of the heart of vertebrates to be as much slower than that in the motor nerves to the skeletal muscles as the contraction of the heart-muscle and the muscle of the digestive tract is slower than that of the former. The rate of conduction in the intrinsic nerves of the vertebrate heart has not yet been determined. In the heart of *Limulus*, this can be done by the ordinary graphic method. The author has shown that in the heart of *Limulus* the rhythm is neurogenic, not myogenic, and that the conduction and coordination take place in the nervous and not in the muscular tissue.² The proofs of these conclusions are demonstrative. The author has lately measured the rate of conduction in the intrinsic heart nerves of this animal and has found it to be 40 cm. per second. The rate in the motor nerves to the limbs as found by the author is 325 cm. to 350 cm. per second. That is to say, *the rate of conduction in the nervous plexus in the heart is from eight to ten times slower than in the peripheral motor nerves.*

II. *Conduction in the Heart in the State of Water-Rigor.*

—The experiments of Fredericq, Waller and Reid, Bayliss and Starling, Schlüter, Engelmann, Hofmann, and Bethe have shown that the heart walls may conduct without contracting or being able to contract. This can be interpreted in two ways, viz.: (1) The conduction takes place in the nervous tissue, or (2) the conduction

takes place in the muscular tissue, but the processes of conduction and contraction are so independent of one another that the muscle may conduct without contracting. The latter is the explanation usually adopted, based on the experiments of Biedermann and Engelmann on conduction in muscle in the state of water-rigor. Engelmann worked on the frog's heart. In the heart of *Limulus* the above two possible explanations may be put to experimental test. The author transected the heart-muscle in the region of the second and the fourth heart-segments and dissected away a portion of the muscle about half a cm. in length, leaving the three portions of the heart connected alone by the nerve-plexus (the median nerve-cord, and the lateral nerves). The anterior and the middle portions of the heart continue in rhythm in virtue of the impulses from the ganglion of the posterior portion, these impulses reaching the two anterior portions by means of the intact nerve-plexus. When this nervous plexus is severed in the fourth segment, the region of the heart anterior to the sections ceases to beat. Hence, the anterior portion of the heart thus prepared beats in response to impulses that reach it through the nerve-plexus on the middle portion. Now, when this middle portion of the heart is placed in water, the muscle of this region absorbs water and ceases to beat or respond to artificial stimulation, while the anterior portion still beats in synchrony with the posterior portion of the heart. The nerves will also lose their conductivity if left in the water long enough. On replacing the water by plasma or sea-water the nerves are quickly restored. The muscle is restored very slowly and sometimes not at all. The nerve-plexus in the *Limulus* heart is composed of nonmedullated nerves, just as is the intramuscular nerve-plexus in the heart of vertebrates. Now, as the behavior of the *Limulus* heart and the heart of vertebrates in the state of water-rigor is the same, and, further, as the anatomic conditions (nerve-plexus and muscle-cells) are similar in both, it seems probable that the tissue concerned with the conduction in water-rigor is also the same in both. In the *Limulus* heart it has been demonstrated to be the nerve-plexus and not the muscle. In the vertebrate heart it has not been demonstrated to be the muscle. The recent experiments of Humblet, Hering, and Erlanger of transecting on compressing the auriculoventricular muscle-bundle in the septum of the mammalian heart decide nothing relative to the myogenic or neurogenic nature of conduction and coordination, because it has been shown by Tawara that this muscle-bundle is surrounded and accompanied by a nerve-plexus similar to that in the auricles and the ventricles themselves.

"*Further observations on the effects of alcohol on the secretion of bile.*" WILLIAM SALANT.

In a previous communication¹ on the effect of alcohol on the secretion of bile, it was stated that diminution in the rate of secretion of bile was observed after intravenous injection of alcohol. No definite conclusions could be reached at that time, however, as to whether the diminished secretion was due to alcohol, for a steady decline in the flow of bile was very often noticed during

¹ Carlson: *American Journal of Physiology*, 1904, X, p. 401.

² Carlson: *American Journal of Physiology*, 1904, xii, p. 67, 1905, xii, p. 471.

¹ *Proceedings of the Society for Experimental Biology and Medicine*, 1904, I, p. 43.

the periods before the administration of alcohol. Recent observations in a series of similar experiments on dogs, in which the rate of secretion remained unchanged for several periods or differed slightly, showed marked diminution of the flow of bile after intravenous injection of alcohol. There was also a decrease in both the organic and inorganic constituents of the bile after intravenous injection of alcohol, but the relative amounts of solids were only slightly affected. The diminished excretion of solids, however, cannot be attributed to alcohol, for a wide range of variation prevails in the organic and inorganic constituents of the bile of untreated animals.

The effects are entirely different when alcohol is introduced into the gastrointestinal canal. The methods employed in this relation were identical with those of the previous experiments. Anesthesia was induced by ether without the aid of morphin. In every case the neck of the gallbladder was securely ligated to prevent flow of bile from that direction. A cannula was then introduced into the common bile duct and the rate of secretion studied by comparing the quantities collected for periods of 15 minutes each. In those experiments in which secretion proved to be very scanty, the bile was collected for an hour and the quantity obtained during that period was compared with the amounts collected for equal lengths of time after alcohol injection. Various strengths of alcohol were used: 25%, 30%, 50%, 60%, in quantities ranging from 1 cc. to 5 cc. per kilo, introduced 1 to 2½ hours after the introduction of the cannula into the common duct.

With the exception of one experiment (XI in the accompanying table), the volume secreted immediately after the injection of alcohol into the stomach or into the intestines showed a marked increase as compared with the period immediately preceding the injection of alcohol. In 11 of the 12 experiments performed on different dogs, the percentage of increase, as shown in the accompanying table (II), ranged from 50% to 365%. In a large proportion of the experiments, in which the dogs were apparently so exhausted that the secretion of bile reached a minimum, on introducing alcohol into the stomach or intestine a striking improvement was noticed. In some experiments alcohol was injected both intravenously and into the intestines. The volume of bile secreted after the intravenous injection indicated a diminished rate of secretion, while in the same animal after the administration of alcohol into the intestines the volume of bile secreted increased 140% in one experiment and 80% in another. The solid constituents were likewise markedly increased. In one experiment there was an increase of 130% in the total solids, 132% increase of organic matter, 115% increase in the ash, the increase in volume in the same experiment being 140%. In another experiment the total solids show an increase of 100%, organic matter 114%, ash 59%, the gain in volume being 125%. In two others the increase in volume secreted as well as in the amounts of solid constituents is 80% in one; in the other, the percentage figures showing increases in the secreted volume, total solids, organic matter, and ash were 160, 185, 195, 111.8, respectively, indicating that at least in a few cases some of the solid constituents

may be increased in amount, both absolutely and even relatively, after introduction of alcohol. In this instance alcohol was introduced into the stomach. The excretion of inorganic constituents, while showing a wellmarked increase after the injection of alcohol into the gastrointestinal canal, did not keep pace with the gain in proportion of organic matter.

Further study is in progress.

TABLE I.—EFFECTS OF ALCOHOL ON THE ELIMINATION OF BILE IN 15-MINUTE PERIODS.

No.	Before injection of alcohol.	After injection of alcohol	
		Volume.	Percentage increase.
	cc.	cc.	
I.....	0.5	1.2	140
II.....	0.5	0.9	80
III.....	0.5 (1 hr.)	1.0 (1 hr.)	100
IV.....	0.15	0.7	365
V.....	0.7	1.8	160
VI.....	0.4	0.9	125
VII.....	0.1	0.4	300
VIII.....	0.2	0.6	100
IX.....	0.3	0.5	68
X.....	0.3	0.45	50
XI.....	1.3	1.5	—
XII.....	0.25	0.5	100

TABLE II.—EFFECTS OF ALCOHOL ON THE ELIMINATION OF SOLIDS IN THE BILE.

No.	Before injection.			After injection.			Percentage increase.		
	Vol.	Total solids.	Ash.	Vol.	Total solids.	Ash.	Vol.	Total solids.	Organic matter, ¹ Inorganic matter.
I.....	cc.	mg.	mg.	cc.	mg.	mg.			
II.....	0.5	34.2	4.6	1.2	78.8	9.9	140	130	132
III.....	0.5	48.6	1.2	0.9	87.6	11.8	80	80	115
IV.....	0.7	74.0	9.3	1.3	211.1	19.7	160	185	195
	0.4	42.3	6.4	0.9	85.1	10.2	125	100	111.8

¹ Calculated by difference from the total solids. The weights of organic matter are purposely omitted from the first two sections of the table.

² Probably some analytic error accounts for this anomalous result.

"Some effects on rabbits of intravenous injections of nicotine:" with demonstrations. I. ADLER and O. HENSEL.

A solution of 1 to 200 of the chemically pure nicotine furnished by Merck was used. Of this solution, ½ of a cc., equal to 1½ mg. of nicotine, was injected daily into the ear-vein of the rabbits. About ten seconds after the injection the animal is seized with a typical convulsion lasting from three to five minutes, after which it is apparently entirely well until the next injection, when the same thing recurs. This is repeated with great regularity and without any exception every day and no tolerance to the poison seems to develop. In two animals it was attempted to gradually increase the daily dose to ¾ cc. This, however, proved too dangerous and was abandoned. All animals thereafter received the same daily dose of ½ cc., which was never increased nor diminished. A number of animals died before they had received a sufficiently large number of injections to cause any definite lesion. Death ensued in some instances from some cause not at all referable to the nicotine poisoning, but in others from numerous small infarctions in the lungs, possibly caused by the intravenous injections. Cerebral hemorrhages, which are found so often in rabbits treated with adrenalin injections, were never found in our animals.

In animals which outlived a certain number of injections, certain distinct and characteristic lesions were

found. It seems, however, that not all animals are equally susceptible. What has been observed in the numerous experiments with adrenalin seems to be true also for nicotin. Now and then, how frequently we are not able as yet to say, rabbits are met with that will take their daily nicotin injection, responding with the typical convulsion, but after months of this treatment fail to show any of the characteristic lesions about to be described. These lesions seem to be identical in every respect with those found after intravenous injections of adrenalin. After 18 injections slight changes are apparent in the bulb and arch of the aorta. After 38 injections very marked and characteristic macroscopic and microscopic lesions can be recognized. Aneurysmatic dilations of the aorta are very distinctly visible. There may be either a single aneurysm, or, what is more frequent, several in various parts of the vessel.

These dilations, as a rule, do not involve the entire circumference of the vessel, but only a limited portion of it, thus presenting the appearance of aneurysmatic pouches. On the interior surface of the aneurysmatic dilations and their immediate neighborhood, larger and smaller patches of calcification of varying shapes are apparent. Their margin is somewhat raised above the surface of the intima, their center somewhat depressed. The more numerous the injections the more pronounced and extensive the alterations appear, but always of the same character. The authors have not yet concluded their experiments and they have not yet been able to carry the number of injections beyond 50. The lesions here described have nothing in common with human arteriosclerosis. They are in every essential identical with what B. Fischer describes as the result of adrenalin and digalen injections. It can be demonstrated that the primary lesion takes place in the muscle cells of the media and first of all in those nearest to the intima. Here the nuclei become broken up, the chromatin is scattered, the entire cell becomes necrotic and is finally destroyed. This process gradually extends downward in the direction of the adventitia. As the muscle cells disappear, the elastic fibers, under pressure of the blood-current, are first stretched, then broken up. The entire wall of the vessel in this spot is thus attenuated and distended and finally calcified. There is distinct *arterial necrosis*. Thus far the authors have been able to find these lesions only in the aorta. The fact that they are found mainly in the aorta, that they occur in patches, that they begin with necrosis of the muscle cells and that thus far only adrenalin, digalen, and nicotin, all three vasoconstrictors, have been found to produce them, would suggest an affection of the vasovorum as the underlying cause. This, however, is not yet proved.

In all advanced cases the left heart has been found hypertrophied. Certain minute lesions have been found in the heart muscle. The kidneys have thus far only shown a moderate degree of hyperemia. An occasional trace of albumin appeared in the urine but never any sugar. In every case that has received a sufficient number of injections very definite changes are noted in the liver. The liver cells appear entirely normal, as do also the central vein and the interlobular vessels, but the

interlobular bile ducts, even at a very early period, are found surrounded by a mantle of leukocytes which increases in volume after the injections are continued. The leukocytes not only surround the ducts but are found within the walls and even in the interior of the duct overlying the epithelium. This latter is always perfectly normal and the lumen, though perhaps here and there partially obstructed by leukocytes, is always sufficiently open to permit the free passage of bile. Bile is never found in the urine. In no case have the authors ever found anything suggesting cirrhosis or degeneration of the liver cells.

"Tumors of wild animals under natural conditions."
HARLOW BROOKS.

The author referred to the great importance of the etiology of neoplasms and the well-recognized fact that research along this line must now rest almost entirely on experimental studies of the lower animals. By this series of observations the author hoped to establish what may be called a "normal" rate of occurrence. This can be based only on observations of large numbers of animals which have been in captivity for only relatively short periods and which must be kept under far different conditions than is possible in the ordinary zoological park or in the laboratory animal house.

The author's observations were made on a large number of wild animals, most of which were captured direct from the wild, and which after capture and transportation were placed under the most carefully studied natural conditions ever attempted in any large zoological collection.

The occurrence rate of new growths in such a group of animals, comprising most of the known species of the reptiles, birds, and mammals should furnish a valuable contribution to the study of the etiology of tumors, especially since the animals included in this collection were, for the most part, at least, pure and uncontaminated, except for such crossing as normally takes place in nature. The animals of the New York Zoological Society have been selected by experts for their purity of type and every one is submitted to a careful veterinary examination before becoming a member of the collection. Notwithstanding that this examination might have been expected in some cases to have excluded animals afflicted with tumors, the records show that none have been rejected for this defect.

Of 2,645 living animals which have been under the charge of the author and his associates for the past five years, no case of true neoplasm has been found. Seven hundred and forty-four animals have died, and, as is the routine custom at the New York Zoological Park, have been autopsied, either by the resident pathologist or by the author. In this series of 744 consecutive cases but one case of tumor has been found. This case, significantly enough, was found in a white raccoon dog, an animal whose purity of species is decidedly in question and which has been classed by some zoologists as a "sport" or albino. The animal has, however, been described by Hornaday as a new species, *Nyctereutes Albus*. The animal was secured in northern Japan, but was unrecognized by Japanese zoologists. The tumor in this case was found to be myxosarcoma of the ovary. Tumors of

parasitic origin, granulomas, tubercles, actinomycotic foci and the like are, on the other hand, relatively common.

In addition to these data, the author also referred to various other animals, chiefly ruminants, taken in the wild, and of which none presented tumors. The latter observation was made by the author himself in the field and was in accord with statements of reliable guides and naturalists.

The author felt that the number of cases cited was sufficiently large to permit him to conclude with a reasonable amount of certainty that true neoplasms are extremely rare in wild animals living under natural conditions. Abnormal conditions of life, such as close inbreeding, semidomesticity or contamination of species as seen in dogs, horses, cattle, and particularly in those animals usually employed for laboratory experiment, notably the white mouse, unquestionably increase the relative occurrence of new growths.

"The cutaneous excretion of nitrogenous material."
F. G. BENEDICT. (Presented by William J. Gies.)

While the larger amount of the nitrogen excreted from the body is eliminated in the urine in the form of urea, uric acid, creatin, and allied compounds, nitrogenous materials may also leave the body in the feces and perspiration. There is, indeed, a possibility of the excretion of free nitrogen in the respiratory and intestinal gases; for, unfortunately, although most physiologists assume that no such excretion of nitrogen takes place, a fundamental demonstration of the correctness of this assumption is lacking. Usually, however, it is considered that the total output of nitrogen is that in the urine and feces. It has long been known that nitrogenous compounds are excreted through the skin, but it has commonly been accepted that the amount thus excreted is extremely small—in fact, too minute to take into consideration in ordinary metabolism experiments.

An examination of the literature of the subject shows that widely varying results have been obtained. The most complete list of investigations into the subject of human perspiration that is accessible to the writer is that of Hoelscher,¹ who, in studying human perspiration under varying conditions, induced perspiration by hot-air baths and found as the average of 22 experiments in which 6,719 cc. of perspiration were collected that 1,000 cc. of perspiration contained 7.1 gm. of solids, of which about 0.6 gm. was urea and the total nitrogen content 0.48 gm.

Perhaps the largest recorded amount of nitrogen found in perspiration not induced by muscular work, was that obtained in experiments reported by Eijkmann,² in three experiments with Malay medical students in Java. He obtained 0.222 gm. of nitrogen in a three-hour experiment, and in two 24-hour experiments 0.761 gm. and 1.362 gm. The subjects were engaged in light occupation, and the perspiration was induced by the tropic climate of Java.

When perspiration is induced by severe muscular

exercise the elimination of nitrogenous material may be very large.

In experiments in the author's laboratory with the respiration calorimeter¹ the subjects of certain experiments devoted a considerable part of the day, *i. e.*, eight hours, to work upon a stationary bicycle. The amount of nitrogen found in the clothes by extraction with distilled water varied from 0.2 gm. to 0.66 gm. per day, the average of 88 days being 0.29 gm.

In 1900 during a study of the food consumed and digested by four members of the Harvard University boat crew² there was apparently a very great gain of nitrogen in the body. It was there pointed out that probably a not inconsiderable portion of the observed gain was to be accounted for by the fact that there might be a large loss of nitrogen in the profuse perspiration resulting from the very severe muscular exercise attendant upon training for a Varsity boat-race.

In a recent study of metabolism with athletes, Lavonius³ found in one case 0.14%, and in the other 0.9% nitrogen in the perspiration. Using the minimum figure and assuming from measurements of loss of body-weight that the weight of perspiration is about 1.8 kg., he calculates the loss of nitrogen to be 1.8 gm. per day in a circus athlete.

It is thus evident that especially under conditions which result in profuse perspiration, such as tropic climate or excessive muscular exercise, a not inconsiderable excretion of nitrogenous material through the perspiration may take place, and further knowledge regarding the amount of nitrogenous material thus excreted is much needed. Furthermore, it is evident that data regarding the excretion of nitrogen under ordinary conditions where there is no sensible perspiration would be of considerable value. In connection with the series of metabolism experiments which are continually in progress in the author's laboratory, opportunity was had to observe in a number of cases the excretion of nitrogenous material through the skin under conditions of both rest and severe muscular work.

Method used in the author's experiments: Before the metabolism experiment began, the subject took a good scrubbing without using soap. This was followed by a shower-bath, and finally the whole body was carefully sponged with clean cheese-cloth and distilled water. A union suit of cotton and cotton stockings were previously thoroughly washed and extracted with distilled water, and after thoroughly drying the body they were put on. At the end of the experiment the union suit and socks were removed and the body carefully sponged with distilled water, all the wash water being carefully saved. The union suit and stockings were then extracted with distilled water several times (never less than four, and frequently eight). The water was made slightly acid to prevent any escape of ammonia during evaporation and the whole mass of wash water concentrated to a small bulk. It was then filtered and only the clear filtrate evaporated, thus eliminating completely epithelial

¹Journal of the American Medical Association, pp. 1-16, June 17, 1909.

²Virchow's Arch. Path. Anat. u. Physiol., cxxxi, p. 170, 1903.

¹United States Dept. Agr., Office Expt. Sta., Bull. 136, p. 118, 1903.

²Atwater and Benedict: Boston Medical and Surgical Journal, cxliv, p. 634, 1901.

³Skand. Archiv., xvii, p. 196, 1905.

scales, hair, fragments of clothing, or other dust. In consequence, none but water-soluble nitrogenous compounds are here considered. On evaporation, the liquid frequently was turbid and before final analysis it was filtered, the nitrogen in the filtrate in certain cases being determined separately from the nitrogen in the precipitate.

The samples were subjected to the usual Kjeldahl process for the determination of nitrogen.

The experiments here reported consist of two kinds: (1) Those when the subjects were at rest; and (2) those when the subjects were at severe muscular work.

Typic rest experiment: Experiment with L. L. A. (December 16-22, 1904).

The subject of this experiment, a man 24 years old and weighing without clothing 74 kg., remained in the respiration chamber seven days from December 16-22, of which the first four days were without food and the last three days with food. During this period he was at rest, and, indeed, the routine of life was such as to call for much less muscular activity than that to which he was ordinarily accustomed. Practically all of the waking hours were devoted to sitting in a chair and reading or writing. The subject wore the union suit and stockings continuously from the beginning to the end of the experiment. After leaving the chamber, the water used in extracting the clothing and in sponging the body contained 0.722 gm. of nitrogen, or, since the experiment lasted seven days, 0.108 gm. per day.

Conclusions regarding nitrogen excretion during rest: As a result of the data of this and similar experiments it has been found that even when the subject has no muscular exercise there is a measurable quantity of nitrogenous material excreted through the skin each day. While there is considerable variation in the actual quantity thus determined, the average is 0.068 gm. per day.

The exact nature of the nitrogenous material thus excreted was not studied. That it is in large measure urea or ammonium compounds is highly probable, though the presence of soluble proteids is not at all impossible. Since in some cases, at least, the perspiration is alkaline and there would be a tendency to lose ammonia by gradual decomposition, these figures must be looked upon as representing the minimum rather than the maximum amounts, and the fact remains that the amount thus excreted per day is certainly worthy of consideration in metabolism experiments, especially where small quantities of nitrogen in the intake and output are involved. Zuntz¹ has already noted this fact and estimates that the loss of nitrogen due to perspiration, wearing off of epidermis, etc., amounts to 0.46 gm. of nitrogen per day. What proportion of this loss is due to perspiration alone he does not state.

Typic work experiment: Experiment with B. N. (January 23, 1905).

During this experiment the subject, a professional bicyclist, aged 28, and weighing without clothing 62 kg., rode a bicycle ergometer in the respiration calorimeter for a period of four hours. The muscular exercise was very severe as was evidenced

by the fact that the subject left the chamber in a profuse perspiration, and the union suit and stockings were soaked with perspiration. The amount of muscular work performed may be seen from the fact that the total output of heat from this experiment was nearly 600 calories per hour. The bath water gave in the filtrate 0.068 gm. of nitrogen and in the precipitate 0.0037 gm. of nitrogen. The extract water from the clothing gave in the filtrate 0.785 gm. and in the precipitate 0.018 gm.

The total output of nitrogen, therefore, during this four-hour experiment was 0.87 gm. or 0.22 gm. per hour.

Conclusions regarding nitrogen excretion during work: The increase in the amount of nitrogen-containing material excreted through the skin when the subject is engaged in severe muscular labor is markedly noticeable; for, while during rest experiments the amount of nitrogen thus excreted is about 0.068 gm. per day, hard muscular labor may result in an excretion equivalent to 0.22 gm. of nitrogen in an hour. Furthermore, the results show with considerable regularity a nitrogenous excretion roughly proportional to the amount of work done; varying in these experiments from 0.22 gm. per hour in the experiment just described, when the most severe work was performed, to 0.18 gm. per hour in one of the other experiments in which the work done was less by about half.

Of greatest significance is the important bearing of this channel for the excretion of nitrogenous material in experiments on the metabolism of proteid. Profuse perspiration, whether induced passively or by muscular work, results in a considerable excretion of nitrogenous material through the skin. While the work engaged in during these experiments was severe, certainly that of the second experiment described above was not extraordinarily so, and might well be equaled by many men engaged in occupations involving muscular work. A total excretion equivalent to one or more grams of nitrogen per day is not at all inconsiderable, and hence in accurate metabolism experiments we must give recognition to the possibility of excretion through this hitherto almost unconsidered channel. Especially is this so in experiments where the total amounts of nitrogen in the ingesta and egesta are smaller than normal, since the percentage error is thereby proportionally increased.

"The effects of intravenous injections of solutions of dextrose upon the viscosity of the blood:" RUSSELL BURTON-OPITZ.

The experiments were performed upon dogs, in accordance with the method devised by Hürthle. When small quantities (5 cc.) of a concentrated solution of dextrose were injected intravenously, the viscosity of the blood became slightly greater. By the administration of large quantities (50 cc. to 100 cc.) the viscosity was markedly decreased at first, but reassumed its normal value in the course of about one hour.

By producing artificial glycosuria, the viscosity was decidedly increased. In the latter series of experiments the surface of the pancreas was painted with solution of adrenalin. The specific gravity of the blood pursued in all cases a harmonious course with the viscosity.

¹ Ber. d. deutsch. pharm. Gesellsch., xii, p. 363, 1902.

DIGEST OF MEDICAL LITERATURE

GENERAL SURGERY.

J. CHALMERS D'ACOSTA

JOHN H. JOYSON
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JOHN W. CHURCHMAN

THE BACTERIOLOGY OF THE URINE IN ITS RELATION TO SURGERY.

A REVIEW AND DIGEST OF THE LITERATURE.

BY

JOHN W. CHURCHMAN, M.D.

The ultimate fate of the organisms which reach the interior of the body cavities, more particularly of the organisms which reach the blood stream itself, has always been an interesting scientific problem; but the inquiry as to whether that fate may be in part represented by the glandular secretions, especially by the liver and kidney secretions, is one that has quite as direct a surgical as a purely bacteriologic bearing. Are we justified in regarding the urine and the bile as normally perfectly sterile; so that if, for example, an intraperitoneal traumatic rupture of gallbladder or kidney be diagnosed, a subsequent peritonitis is not to be feared? Or are we to regard these excretions as infectious and to regulate our peritoneal toilet and our general surgical attitude accordingly? More than a "purely scientific" inquiry this surely is, for in this very question of peritoneal toilet great carefulness in guarding the peritoneum will be sure to follow a belief that the urine and bile are always infectious, just as careless technic is pretty sure to result from shaky bacteriologic convictions.

Concerning the fate of circulating organisms in disease, it has long been known that a certain proportion of them leave the body via the secretions. The contagiousness of scarlatinal urine was a very early observation; long before the anthrax bacillus was discovered the ability of the urine to propagate the disease was well known (Schweizer); the typhoid bacillus was long ago found by Gaffky in the renal vessels, and the occurrence of the tubercle bacillus in the kidney secretion is a matter of very common experience. The "cystitis é nephritide" of Rovsing offers another clinical example. The more recent work, too, has amply supported the early findings in regard at least to typhoid fever, where the question could be submitted to bacteriologic inquiry. Richardson ("Upon the Presence of the Typhoid Bacillus in the Urine." *Bost. Med. and Surg. Jour.*, clxviii, 6, p. 152, 1903. "Recent Bact. Studies in Typhoid Fever." *Bost. Med. and Surg. Jour.*, cxxxviii, 7, p. 148, 1898), for example, in a large series of typhoid patients, isolated the organism from the urine in 21.35% of the cases, usually in pure culture and in enormous numbers.¹ Petruschky ("Über Massen ausscheidung von Typhus Bacillen, u. s. n." *Centralbl. f. Bakteriol.*, xxiii, 14, 1898) and Gwynn ("The Presence of Typhoid Bacilli in the Urine." *Bulletin of the Johns Hopkins Hospital*, x, 99, p. 109, June, 1899) reported similar find-

ings. Lépine and Lyonnet ("Sur l'infection typhique expérimentale chez le chien." *Gaz. des Hôp.*, 87, 1899) were able, after experimental intravenous inoculation with pure cultures of typhus, to isolate in a few hours the bacilli from the urine and bile; and Faulhaber ("Über das Vorkommen von Bakterien in den Nieren bei akuten Infektions Krankheiten." *Beitr. z. Pathol. Anat. u. allg. Path.*, x, 2 u. 3, p. 81, 1890) in a study of 58 cases of infectious diseases of various sorts was able to cultivate the corresponding organism in 38.

But it at once occurs to ask, whether this extrusion of organisms takes place through a perfectly healthy kidney; and whether, if so, such a bacterial excretion is not constantly going in the healthy body, organisms absorbed in the intestinal canal and elsewhere being thus ushered out of the body. It may at once be said that ureteral bacilluria is, both as an experimental and a clinical observation, by no means always or necessarily accompanied by any signs or symptoms of nephritis that we can detect, and that if we are to speak from the clinical side alone, that is to say, without histologic examination of the kidneys, we are justified in concluding that organisms often pass through perfectly normal kidneys.

But, as a necessary preliminary inquiry, do organisms reach the kidney in normal individuals? The answer at first given to this question was a decided no. Opitz ("Beiträge z. Frage d. Durchgängigkeit von Darm u. Nieren." *Zeitschr. f. Hyg. u. Infekt.*, xxix, 3, p. 505, 1898), in a fairly extensive research, supported the position previously taken by Neisser, and declared, as against results published by Bécos, that the uninjured intestine was impenetrable by bacteria. Similar results were obtained by Marcus ("Über die Resorption von Bakterien aus dem Darne." *Zeitschr. f. Heilkde.*, xx, 5 u. 6, p. 427, 1899), who was able to find no organisms in the urine 26 hours after ligating the intestine and the urethra, and who stated that intestinal bacteria were retained by the lymph-glands in the intestinal wall. Only after injuries to the intestine did he find that organisms were able to pass through the wall. The bacteriologic investigation, too, of the normal organs made by Meissner, Hauser, and others strengthened in an indirect way the idea of the impermeability of the intestinal wall to bacteria; for the normal organs were found to be absolutely sterile, a finding that would not be expected if bacteria were constantly being absorbed from the intestines and were circulating in the blood.

On the other hand, certain observers claimed to have produced cystitis by ligating the intestine, and the not infrequently seen cystitides without known cause were, on this experimental basis, referred to an intestinal absorption connected with constipation as their cause. Finkler and Prior (*Centralbl. f. Allgem.-Gesundheits-Pflege-Ergänzungs-hefte*, Bd. I, Heft. 5 u. 6), too, found the spirillum of cholera in the urinary bladder after injecting cultures of it into the duodenum.

Moreover, Ford ("The Bacteriology of Healthy Organs." *Transact. Asso. Amer. Physic.*, xv, p. 389), in a recent research has shown that the normal organs (liver, spleen, and kidneys, at least) are not sterile, but

¹ His opinion is that the organisms multiply rapidly in the bladder and do not actually come through the kidneys in such quantity.

that organisms can be consistently grown from them; and he thinks that the passage of organisms from the intestine into the mesenteric circulation bears some relation to digestive absorption. Boni ("Untersuchungen über den Keimgehalt d. normalen Lungen." Deutsch. Archiv. f. klin. Med., lxi, 5 u. 6, p. 542, 1901) has found normal organisms in the lungs. It seems, then, probable that bacteria can and, from Ford's results, do in normal cases reach the kidneys. Are they there excreted or withheld? The early experiments on the permeability of the normal kidneys were made with coloring materials. Ponfick, Hoffmann, and Langerhans, and von Rüttimeyer—among others—showed that coloring matter injected into the circulation could be later found in the organs—at first in the vessels, later in the fixed cells of the connective tissue. Wyssokowitch (Zeitschr. f. Hyg. u. Infekt., Bd. i, p. 1), following this work up bacteriologically and endeavoring to find out what became of organisms injected into the circulation—their early disappearance from the bloodstream having been noted by Traube and Gscheidern, by Fodor ("Sitz ungerbicht der Mathematisch-Naturwissen." Classe der ungarischen Akademie der Wissenschaften von 18 Mai, 1885), and by Wyssokowitch himself—was able, both by cultural and by histologic methods, to find the organisms in the organs themselves, where, by virtue of the results of his subsequent studies of the secretions (he found them sterile), he concluded that they went "zu Grunde."

But is this conclusion justifiable? Or do the bacteria which we have traced up to the kidneys, and which we have found passing out of the circulation into the organs themselves, instead of dying out there, leave those organs by "excretion?" We know that in the case of many pathogenic organisms this does happen; but it is then always possible to assume that we are dealing no longer with perfectly normal kidneys, and that the minute hypothetic renal lesions are responsible for the bacterial permeability.

The opinions on this subject found in the literature are very variable. Kruse (Flügge's "Mikroorganismen," Bd. i, p. 379) regards excretion through the secretory organs as unlikely, except when those organs are diseased, but thinks that these glands when healthy are not absolutely impermeable to bacteria. Fütterer ("Wie bald gelangen Bakt., u. s. n." Berl. klin. Woch., xxxvi, 3, 1899) concludes, from his animal experiments, that organisms injected into the portal vein pass in enormous quantities through the normal kidney and liver. Biedl and Kraus ("Über die Ausscheidung der Mikroorganismen durch die Niere." Archiv. f. exp. Path., Bd. xxxvii, Si. "Weitere Beiträge, u. s. n." Centralbl. f. innere Medizin, 1896, S. 737. "Über die Ausscheidung der Mikroorganismen durch drüsige Organe." Zeitschr. f. Hyg. und Infekt., xxvi, S. 353) call the appearance of microorganisms in the glandular secretions "a true physiologic excretion." Opitz ("Beiträge z. Frage d. Durchgängigkeit von Darm u. Nieren." Zeitschr. f. Hyg. u. Infekt., xxix, 3, p. 505, 1898), after a careful experimental research, concludes that there is no such thing as a physiologic excretion of circulating organisms through the normal kidneys.

Homén and Bonsdorff ("Die Wirkung der Streptokokken, u. s. n." Beitr. z. Path. Anat. u. allg. Path., xxv, 1, 1899), working with the streptococcus, find that pathologic alterations in the kidney are essential to the passage of organisms through it. von Klecki finds streptococcus, pyocyaneus and other organisms injected intravenously soon appearing in the urine, and the kidneys remaining normal. Pernice and Scagliosi ("Über die Ausscheidung der Bakt." Deutsch. med. Woch., xviii, 34, 1892) find pathogenic and nonpathogenic organic organisms both passing through the kidneys, but both producing local circulatory and degenerative changes there. Casper (Deutsche med. Woch., xxxi, 30) believes that in advanced pulmonary tuberculosis, tubercle bacilli get through the kidneys without causing any lesion there; Schweizer ("Über d. Durchgehen von Bacillen durch die Nieren." Virchow's Archiv., cx; ref. Baumgarten, 1887, S. 410) believes that the kidneys are bacteria-permeable, but that large numbers pass through only when the glomeruli are, in part, diseased; Lister (Transact. Royal Soc., Edin. 1875) finds the normal urine bacteria-free; Damsch finds animal inoculations with urine from tuberculous patients, without urogenital lesions, negative; Wyssokowitch (Zeitschr. f. Hyg. u. Infekt., Bd. i, p. 1), after an exhaustive and careful experimental research, decides emphatically against the possibility of bacterial excretion through uninjured kidneys. Noetzel ("Exp. Studie z. Frage d. Ausscheidung von Bakt. aus dem Körper." Wien. klin. Woch., xvi, 37, 1903) reaches the same conclusion. Cavazanni ("Über die Absonderung der Bakterien durch die Nieren." Centralbl. f. Pathologie, 1898, Bd. iv) finds *Bacillus prodigiosus* appearing in the urine after intravenous injection only when some kidney irritant (pyrogallol or cantharides) was simultaneously introduced or when the renal artery was tied. Cohnheim ("Vorlesungen über allgemeine Pathologie") thinks of the excretory capability of the normal kidneys as an admirable adaptation of nature for the protection of the body, and points to the excretion of bacilli in tuberculosis as a notable example of it. Thomas (Neubauer u. Vogel. Harnanalyse 8 Aufl., 2, Abth., S. 485) thinks the normal kidneys capable of bacterial excretion without themselves becoming diseased.

There can be, however, no doubt that the majority of the most careful experimental work on this subject—as represented, for example, by the researches of Wyssokowitch, Homén, and Opitz—speak strongly against the permeability of the kidneys for bacteria so long as they remain wholly without lesions—lesions which, as Opitz suggests, may be caused by the so-called "harmless" organisms. It is interesting to compare the findings in the case of the liver where bacteriologic studies of the bile have been made. Of course here, again, the bacterial content—at times the rich bacterial content—of the bile in certain diseased conditions is now well known; in the case of typhoid fever, for example, it is a clinical commonplace. But is the bile in "normal" individuals sterile? Létienne ("Recherches bactériologiques sur la bile humaine." Arch. de Méd. expér., iii, 6, p. 761, 1891), in an examination of 42 corpses, found plates made from the gallbladder sterile in 18 cases; and he con-

cluded that the bile, while normally bacteria-free, was very readily infected in the case of infectious diseases. Ninni ("Contribuito clinico all'azione della bile normale sul peritoneo." *Rif. med.*, viii, 108, 1892) reported an interesting case of abdominal injury, with death from serofibrinous peritonitis, in which the section showed no cause for the condition beyond two wounds in the convex surface of the liver, through which bile had escaped into the cavity. Experimental research made subsequently by him led him to the conviction that the bile, if allowed to escape into the peritoneal cavity in large quantity, would set up there a serofibrinous peritonitis. Fränkel and Krause ("Bakteriologisches und Experimentelles über die Galle." *Zeitschr. f. Hyg. und Infekt.*, xxxii, 1, p. 97, 1899), examining the gallbladders 1 to 40 hours after death found 108, out of 128 examined, sterile, and decided thereupon against the excretion of organisms through the normal liver; but the gall from 34 cases dead of tuberculosis with no intestinal or hepatic lesions, produced the disease when injected into guineapigs. The evidence is here again contradictory; but there seems ground for suspecting, at least, that large quantities of bile, in a certain proportion of "normal" individuals, are infectious. In the case of the urine it is to be noted that no experiments have been made with really large quantities of the secretion and that the experimental evidence is for this reason not absolutely complete. Nor has sufficient attention been paid to the possible effect of digestion on bacterial absorption by a study of the urine immediately after meals. Still, allowing for these defects and gaps in the experimental evidence we are warranted in drawing the following conclusions:

The normal kidneys—while possibly not absolutely impermeable to bacteria—play a very unimportant role in helping to rid the body of organisms. Only when they or their vessels have been injured do the bacteria escape in any quantity and then we are dealing with a pathologic and not a physiologic process.

2. The urine from the normal kidneys, as studied at least in relatively small quantities and independently of digestion, is sterile.

3. Organisms brought to the normal kidney meet their fate, for the greater part at least, by passing into the gland substance rather than through it into the urine.

The normal urine then may, by the surgeon, be regarded as sterile. In large quantity, however, it may contain organisms. These have been found (Bonif, Ford) in the normal organs; and since all observers agree that slight kidney lesion is sufficient to make this organ permeable, it is quite possible that bacteria may leave the kidney via the urine more frequently than has been thought. The practical surgical conclusion from the work that has thus far been done is that even normal urine, while not to be feared in very small quantities, should always be treated with respect in peritoneal surgery.

THE GENITOURINARY TRACT.

Results of Subcutaneous Administration of Chlorids after Nephrectomy.—Brandenstein and Chajes (*Zeit. für klin. Med.*, Bd. lvii, p. 265) have based their experiments on the theory that the edema of renal

disease is due to a retention of chlorids. After the injection of moderately strong chlorid solutions into nephrectomized rabbits, they found that the percentage of sodium chlorid in the blood was barely increased, while the osmotic pressure and percentage of residual nitrogen were considerably raised. At the same time the refractive index of the blood-serum was reduced. For this reason the authors attribute the fall in the percentage of chlorids in the injected fluid to an increase of fluid, derived from the organism. An estimation of the chlorid content of the liver showed only a moderate increase, pointing to the conclusion that most of the retained chlorids accumulates in the bodily juices and not in the parenchymatous tissues. In most of the animals experimented upon, there occurred cutaneous edema, ascites and hydrothorax, which phenomena were more marked than in control animals injected with plain water. The authors explain the occurrence of edema in renal insufficiency primarily by the retention of certain organic substances, embraced in the residual nitrogen, together with a hydremic condition of the blood. These factors render the vessel walls more permeable, and fluid passes into the tissues. The abnormal accumulation of fluid in the blood and lymph vessels is explained primarily by the retention of chlorids, the excess of which holds back a corresponding amount of water. In the more advanced stages of renal insufficiency there may also be a direct disturbance of the function of water excretion in the kidneys. [B.K.]

Examination Concerning the Renal Function after Nephrectomy.—T. H. Schilling (*Arch. f. Exper. Path. u. Pharmak.*, 1905, lii, 140) has operated upon the kidneys of 54 rabbits, performing 180 tests and urine determinations on them. He found that animals with one kidney void concentrated sodium-chlorid solutions given by mouth as quickly as normal animals, so long as the amount of water given them to drink is not cut down. If less than the usual amount is given, the saline solution is not voided so concentrated as in normal animals, and they require a longer time to excrete it. This is probably due to back absorption of water from the kidney. After compensatory hypertrophy has been completed, the kidney will have learned to do its increased amount of work, and to eliminate the sodium chlorid in the same manner as the two kidneys had done. If a great deal of spring water is given such animals, they require a longer time to secrete the urine as concentrated as before. The one kidney is not capable of removing large, intravenously introduced, isotonic sodium chlorid solutions so quickly as the two kidneys. Indigocarmine solutions are not excreted so concentrated as in normal animals; and the animals with one kidney removed produced much less sugar, when phloridzin is injected, than do animals with two kidneys. This fact lends credibility to the view that in phloridzin diabetes the kidney is the point at which the sugar is formed. If, however, the hypertrophy continues, the way to produce sugar is slowly learned by the organ. In cases of caffeine diabetes there is no connection between the polyuria and the glycosuria. The diuresis arises as the result of the action of the caffeine on the renal cells. The point of production for the sugar lies outside the kidney. In a number of cases, an increased amount of urine without a previous diminution appears after nephrectomy. [E.L.]

Punctured Wounds of the Bladder.—E. Evans and H. A. Fowler (*Annals of Surgery*, August, 1905) state that wounds of the urinary bladder are extremely uncommon except when produced by a surgeon's instrument. They occur most frequently in military life. The writers report a case of puncture through the perineum entering the peritoneal cavity. They also summarize the literature of the subject. They divide wounds into those presenting an external wound and cases of rupture. The bladder may be reached by penetrating instruments through the suprapubic region, the

obturator foramen, and the perineum. The diagnosis is rarely difficult. The escape of blood mixed with urine leaves no doubt. If there is prolapse of omentum, as in the case reported, or of bowel, there can be no doubt as to peritoneal involvement. If doubt exists, an exploratory incision should not be delayed. Extravasation from a healthy bladder may not cause peritonitis for many hours, but in punctured wounds the danger of infection is increased many fold. In infected wounds the essential point is free drainage. Such a case will heal promptly with care of the wound and a retention catheter for a few days, or regular emptying of the bladder every three hours. If the wound is small and the escape of urine insignificant, it should be opened up freely by incision and free drainage established. Intra-peritoneal wounds mean immediate laparotomy, closure of the wound by sutures, and removal of blood, urine, and foreign bodies from the peritoneal cavity. Statistics of intraperitoneal wounds are far from satisfactory, but are improving, as shown by the tables given. [H.M.]

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Smallpox a Luxury.—Reiteration of the value of vaccination and the consequent necessity for laws compelling its acceptance by those who would not of their own free will seek its protection, would be unpardonable were it not for the numbers of the opposition. From the medical point of view there seems logically only one side to the question, but there are physicians as well as laymen who insist upon the uselessness and even danger of the process. In a very plain statement recently issued to the taxpayers of Pennsylvania, Commissioner of Health Dixon presents solely the financial aspect of neglected vaccination, with the hope of thereby impressing those to whom statements regarding sickness and death do not appeal. At the lowest estimate it costs the State \$350 for each person outside of cities quarantined to prevent the spread of smallpox. This means that during 1903 more than \$2,000,000 of State money was thus expended, or, as well put by Dr. Dixon, was wasted simply to gratify a whim of those who oppose vaccination. If such people do not appreciate this waste of money, surely those who are protected by vaccination are entitled to protest against the resources of the State being "consumed in this way in order to permit a few obstinate fanatics to indulge their pet fancy of being allowed to have smallpox if they so desire." A remedy mentioned by Dr. Dixon, namely, meeting the cost of controlling smallpox by a tax upon those who refuse vaccination, would doubtless prove a strong argument to such recalcitrants. The experience of Williamsport in expending \$284 for each of 18 cases of smallpox and at the same time protecting some thousands of persons by vaccination at a cost of 29 cents each, should appeal to persons whose gray matter can be aroused only by excitation of their pocketbooks. Veritably, smallpox is a "luxury and not a necessity!"

The age at which drunkenness is established was investigated by Dr. Chas. L. Dana,¹ and his con-

¹New York Medical Record, July 27, 1901.

clusions, being based upon some thousands of cases, are not only of great scientific value, but have a practical application as well. Briefly, it might be said that inebriety usually begins before 20 years of age, and if a man has not indulged to excess before he is 25, he is not likely to do so later. There are so few who begin excessive drinking between 30 and 40 years of age, that one who has reached the age of 30 without excesses is almost surely safe. Dana stated that no cases arise after 40 years of age. There is a popular idea, no doubt, that numerous cases do arise after 40, but it is not at all unlikely that investigation into their early histories will bring to light a long series of occasional overindulgences with some symptoms dating back to childhood. Dana evidently refers to real inebriety in youth, and not to the lapses which so many young men wrongly assume to be a part of their education, nor does he assert that all youthful inebriates are incurable, but merely that old cases began at an early age. Wild oats must be reaped in sorrow and pain, but they do not necessarily choke the whole crop of good seed. These statistics are of such profound significance that it is quite remarkable they have elicited so little comment and have not been made the basis of practical measures for the prevention of drunkenness.

The cause of the early incidence of inebriety is not known, and probably cannot be discovered until there has been more investigation of the pathogeny of this disease, and there now seems to be no reasonable doubt that there is a pathologic basis for the craving. Of course, it is also generally believed that there is a habit generated by the pathologic changes wrought by the alcohol itself, and that in the immature years these effects are more easily produced than later. Dana seemed to believe that it was a matter of habit and environment, though it had a neuropathic basis. It was one of the accidents befalling the nervously unstable, who are not sufficiently protected until age could work

greater stability. The average healthy man might, and perhaps does, outgrow his youthful indiscretions, but the defectives cannot. There might be some cases congenitally so neurasthenic as to be unable to stand the ordinary stresses of life and who would drift into drunkenness or vagabondage no matter what guards surrounded their childhood. It is hard to believe they are numerous, though the wish may be father to the thought. The neurasthenic cases constitute but 20% and it is easier to believe that in most of these the weakened nervous condition is acquired. Ten percent are periodicals, and here a real defect of development can be assumed, the causes having been active either prenatally or in the early years of life, with bad heredity probably an additional factor. These few cases are the only ones in which we can afford to be pessimistic as to prevention in youth and early manhood. The 70% who are mere besotted drunks seem to be results of the habit of indulgence accidentally acquired in a bad environment, the original nervous instability having been most probably the normal condition of youth exaggerated, to be sure, though not to a pathologic degree. There is some evidence of more or less neuropathic taint in relatives of these unfortunates, but how often is not known.

Paying boys to abstain from alcohol is a distinctly modern movement and though it has a firm scientific basis for a trial, it was no doubt suggested to many a father as a means of protecting his sons from dangers which nearly wrecked his own life. Every little while we learn of some boy who has been promised a certain sum upon his twenty-first or twenty-fifth birthday or even yearly—the sole condition being abstinence from alcohol, tobacco, or both. The average boy will work for such a prize as a matter of course, and it will tide him over the period in which alcohol does the most harm. If it is really true that abstinence until 25 insures a life of sobriety, by all means let the scheme be extended to more boys until it becomes fashionable. Boys are sticklers for custom and will shun drink as soon as it becomes bad form. Happily it is a method which cannot possibly do harm even if it is not based upon a true hypothesis—and its possibilities of good seem so large that it would be criminal not to try it. Should the early incidence of alcoholism really mean that it is due to a pathologic nervous instability—and there is no reason to believe it to be so caused except in the minority of cases—then the boy is apt to be abnormal anyway, if not alcoholically then in some other habit. Yet it is reasonable to believe that many of these cases, after a few years of right living with good food, might become sufficiently stable to be in no further danger, and then they could indulge moderately or not, as they please.

Perhaps, also, much of the disease is due to poor nourishment in infancy and childhood, so that there are other things to be done beside inducing abstinence in youth. There are many causes to be discovered and eliminated so that pledges and bribes are only adjuvants after all. We are drifting in the right direction anyhow. Edward Eggleston¹ says: "It was estimated early in the eighteenth century that about one building in every ten in Philadelphia was used in some way for the sale of rum," and in Massachusetts, Governor Belcher was afraid that the colony would "be deluged with spirituous liquors." The outlook is not so bad that we need worry. We cannot permit nature to evolve national sobriety by her old trick of killing off all the drunkards, the method explained by Dr. G. A. Reid, in his book on alcoholism. It is too expensive in valuable lives—prevention is the new method in this day and generation.

A legal definition of "practising medicine," as the term is used in the New York statutes, has been handed down in a dissenting opinion by Justice Joseph M. Deuel, of the Court of Special Sessions, in the case of an osteopath who had been prosecuted by the County Medical Society, and fined for practising medicine without a license. It is the same Justice Deuel who is suing the editor of *Collier's Weekly* for libel, as a result of an editorial statement criticising the Justice for connection with *Town Topics*. The Justice remarks that the practice of medicine consists of three things—diagnosis, discovery of the cause, and the cure by drugs, and that if a doctor does not prescribe drugs he is not practising medicine. This must be wormwood and gall to the therapeutic nihilists, and it should stimulate our pharmacologists and therapeutists to renewed activity in their efforts to restore their special science to its at one time preeminence. In the meantime, the surgeon who reduces a dislocation and the physician who cures a tuberculous patient with cold air and good food, are not in the practice of medicine at all. It is difficult to comment temperately upon such a blow at the medical profession; indeed, it is not possible to follow out the mental processes which result in such a conclusion. It is to be hoped that there are no other legal minds so constituted. He also stated that the statutes aimed to suppress "the ignorant and indiscriminate administration of drugs and lotions," though it must be a curious man who will administer a lotion. It is said that already the osteopaths are to use this remarkable decision to fight for recognition and for a license to practise medicine without medicines, and knowing nothing of medicine. They are to make much of the statement

¹ Century, May, April, 1885.

that this particular defendant did no harm, even if he did no good. They will get small comfort, for it is quite doubtful if there are any other justices who have such views on medical topics.

A case of superfetation has been reported from Albany, N. Y., in the lay press. It is asserted that a young woman of 20 gave birth to a full-term child on August 29, and 116 days later to another, both now living. Dr. Geo. T. Moston, of 611 Central Avenue, is reported to have attended the woman in the second confinement, but there was no physician in attendance at the first, nor can the nurse be found. The family are apparently astonished and this astonishment is the only evidence of the truth of the phenomenon. Of course, superfetation is possible during the first three months after the first conception, but after this time the uterus is hermetically closed and impregnation is impossible. Nevertheless, the alleged cases do not stand investigation, and it is generally believed that there are no authentic instances with a normal uterus. It is said that one twin might be born and the other delayed owing to lack of development, but this explanation is merely a guess, and is useless until authentic cases are found. In the rare event of a double uterus the phenomenon is possible, and in 1855 Fordyce Barker reported such a case, in which he attended the woman, a mature male being born July 10, and a full-term female on September 22. The Albany case should be investigated, for it is certainly unique if it can be authenticated. The French obstetricians are rather inclined to believe such cases possible, while the English and Germans are quite sceptical. The Albany profession can clear up the matter, which at present cannot be accepted as authentic until it is shown that the first child was really born of the same mother as the second.

The child's environment is receiving more and more attention every year, on account of the growing conviction that heredity has been much overworked in accounting for juvenile depravity. Long ago there was a reaction against Lombroso's extreme views as to inherent and inherited criminality. He no doubt did find that many criminals were quite abnormal, physically and mentally, but it is now thought that these defects are not always inherited, but due to bad surroundings or poisoning in early infancy, or even in intrauterine life—alcoholism, and the like. In addition, it is found that many criminals are not more abnormal in body or brain than the noncriminal class, but were taught to be evil in childhood. According to our consular reports, Prof. Lino Ferriani finds that 80% of Italian child criminals are really normal children, who were taught wicked-

ness in a bad environment, about two-fifths having criminal parents. Upon this theory our sociologic workers have been removing child offenders from the environments which injured them. From time to time very gratifying results have been recorded, and the last report of E. Fellows Jenkins, chief probation officer of the children's court of New York, is exceedingly good. In three years 3,877 youthful convicted offenders have been released on parole in the custody of parents and guardians and 83.2% have recovered normal moral tone. It is shown that there are regular schools in New York where boys and girls are trained to crime, the instructors selecting the brightest boys for the work and using dummy figures to teach pocket picking, as in the days of Dickens' Fagin. It isn't heredity, then, at all, but environment which makes so much of our criminality. The human ovum, like every other organism, reacts to its environing forces, and will grow correctly if it is in a correct environment. It tends to the average or normal if permitted, and is never abnormal unless forced to it by exceptional forces; that is, it tends to resemble its ancestral type and not necessarily its parents. These new reports as to criminality are certainly bound to have wide influence upon our future work in the slums. The effort now is in the direction of preventing the formation of criminals, and not the cure of the criminal who is incurable. The child must be grown as carefully as a farmer grows his plants.

"That Last Waif" is the title of one of the works of Horace Fletcher and is based upon an experience in Chicago in which he was brought face to face with the system whereby little tots were turned into the streets to be drilled in crime. The awful environments of these babies fully explained to him the reasons for their abnormal growth and he has joined in the modern crusade to stop the production of criminals. It well repays one to read this little book, for though it is somewhat too optimistic as to the expected results, it is splendid testimony as to the value of the environment. It is apparently forgotten that many a child has been too greatly damaged in intrauterine life to become normal. No amount of attention after birth will suffice. Luckily these prenatally doomed victims of parental vice, disease, or accident are in the small minority. The point of this whole matter is this, how long will society permit men to bring babies into the world to be thrust into the streets as soon as they can toddle to become parasites on the social organism. The parents of the street waifs are the real criminals and it is time to investigate if they cannot be compelled by law to pay for the proper rearing of their children or suffer confinement themselves as public enemies. We are running into socialism too fast

in this respect, for it will be a long time before the State can naturally assume the duties of a family and raise children. It requires too much individual care for each one, and the parent must give it or remain sterile.

The indeterminate sentence has been discussed by Samuel J. Barrows, secretary of the Prison Association of New York City, in a report to the State Conference of Charities, and it is gratifying to know that this most natural system is gaining such recognition. Not only is it in accord with modern views on heredity, but it is found to be an essential, beneficent, and economic feature of our judicial system. The basis of this work is the fact that juvenile offenders are not subjects for punishment, but for removal from the evil surroundings which have injured them. To treat them as criminals is to make them criminals, for it is known by sad experience that confinement of a boy among hardened men is to doom him to a life of crime. The juvenile courts, which are now being established everywhere, are designed to wipe out this blot upon our civilization—the child is simply put on probation. Older boys and those who have relapsed must be given a sentence which means confinement until cured. A board, in which medical men are represented, should decide in each case whether or not the convict can be released on parole, and, of course, he is not to be released until some means can be found whereby he can earn his living in proper surroundings. There is now a proposition to apply the system to every offender and stop the farce of confining incorrigibles for short periods and then turning them loose to prey upon society until caught again. It is even demanded that inebriates shall be similarly dealt with. The whole plan is so reasonable and so in accord with modern ideas that it is desirable to have it universally adopted. It merely means that every offender against society is to be confined until it is moderately certain he will not offend again, and that if he is incurable it will be far better for him and for society to confine him for life. No convict should be confined for a fixed time, nor should he be released unconditionally. He should be reconfined at any time he relapses. Unfortunately, it will require the voluntary cooperation of generous and humane people, and this aid may not be forthcoming.

The problem of the unemployed is as old as mankind. "Why stand ye here all the day idle?" was said in the parable of the employer to the idle laborers in the market-place 20 centuries ago, and the same types of men nowadays have annual parades in London. The cry for help is thus two-sided—one-half the world seems to be seeking work but cannot get it, and the other half is seeking workers but cannot find them. Thousands

are practically homeless, while there are thousands of good homes waiting for them if they will only work. We have 150,000 tramps in the United States—even France is said to have 20,000. Careful investigations in Belgium some years ago revealed the fact that all the vagabonds were profoundly neurasthenic, utterly unable to furnish the nerve force to work. Whether this condition was due to congenital defect or the poor feeding of childhood or exhaustion of diseases is not known, but it is known that efforts to place these men at work generally fail for this reason, they cannot work, they are unemployable parasites upon society. Charles Booth says that the "modern system of industry will not work without some unemployed margin, some reserve of labor," and "for long periods of time large stagnant pools of adult effective labor power must lie rotting in the bodies of their owners, unable to become productive of any form of wealth, because they cannot get access to the material of production," while "facing them in equal idleness are unemployed or underemployed masses of land and capital, mills, mines, etc., which, taken in conjunction with this labor power, are theoretically competent to produce wealth for the satisfaction of human wants." If this means anything it means that a certain percentage of mankind is always incompetent for one reason or another and that there are always places to be filled and but few to fill them, though many men are idle. "Many are called but few are chosen."

Civilization is unjustly blamed for poverty, for investigations into ancient conditions show them to be far worse than present ones. Even as late as the time of Henry VIII poverty was so extreme and extensive with its accompanying diseases that the average duration of life was only half what it is now. Modern laborers live in a condition which would then have been considered extreme luxury. The only difference between old and new times is the fact that formerly there was no help extended to those in temporary need of it, while now it is practically impossible to starve to death except by the slow process of improper food. In savage life periodic periods of starvation are the rule; indeed in isolated higher communities also. Civilization is a compact organization for preserving all the units and to bind the whole more firmly together. It is not exactly charity which does this, but modern mutual aid, through every conceivable form of operation, which even goes to the point of preserving burdensome units, which can never render material assistance.

Public pauperism is really parasitism and it seems to be a modern disease, due to the very ease with which assistance can be obtained. Man, like every

other organism, takes the path of least resistance. Once relieved of the necessity for the struggle for existence, he ceases to struggle and his power of work atrophies. He then lives at the expense of the organism to which he is attached. There is a large class of men who derive good incomes from railroad accidents which they skillfully bring on. It is even reported that men have voluntarily suffered serious injuries even to the point of losing legs, and all for the sake of the pension. Since biblical times, and long before, paupers existed in every civilization, but it is only within a century that they have become a dreadful public burden; they were formerly more apt to be hangers-on or retainers of the well-to-do. The appalling increase of public paupers in England is now being duplicated in America, and it is a real disease of society, a disease due to an abuse of natural laws. It follows the rule of every disease due to atypic and abnormal cell growth of any kind. From being benign it can become malignant and can injure the organism (society) or even destroy it. It is a very natural result of our necessity to save every human life and prolong it to its greatest length. It therefore behooves physicians, who are more vitally interested in the matter than any other class of life-savers, to look into the cause of the disease and the remedies. It is to the interest of every worker to reduce the number he must support in idleness, so the problem comes home to every citizen. It is even found that a large pension is apt to curse a man instead of blessing him, for he ceases the struggle for a living and is content with mere food and lodging. Nothing is more pitiable than the state of men who are pensioned too soon. It is a sociologic necessity to render aid only when it is needed and compel men to keep up the struggle for existence. The present trend of thought is in the direction of relieving society of its burdens and shifting them to the shoulders of the individual families or relatives. In addition, there is a growing protest against the indiscriminate and maudlin charity which is thought to be responsible for the dreadful increase of pauperism.

Memorial to the Late Dr. Joseph Leidy.—A circular has been issued by a number of public-spirited citizens asking for contributions toward a fund to erect a statue of Dr. Joseph Leidy on the City Hall Plaza, Philadelphia, in recognition of his memorable work in the field of natural science. It is pointed out in the circular that nothing has been done in Philadelphia to perpetuate the memory of the famous physician, whose life's work was intimately associated with the advanced place which this city holds and has held in the scientific world, although such recognition is not lacking elsewhere. Dr. Leidy was universally recognized as the most distinguished figure which American science produced in the last century. This city was the scene of his labors for an uninterrupted period from 1840 to 1890. He was born here in 1823 and died in 1891.

BOOK REVIEWS

Postoperative Treatment.—By NATHAN CLARK MORSE, A.M., M.D. P. Blakiston's Son & Co., Philadelphia, 1905.

The author gives an epitome of the different methods in use by various surgeons in their treatment of post-operative conditions. Throughout, this is supplemented by the author's own experience. He has treated the subject on broad lines, taking up, first, the general principles of care in such conditions, then particularized, treating of the conditions following surgical procedures in the various regions of the body. The author not only discusses the care of the wound itself, but also the general care of the patient. The work is well illustrated and should be of value, especially to those students starting in practice without hospital advantages.

A Textbook of Physiological Chemistry.—By JOHN H. LONG, M.S., Sc.D. Philadelphia: P. Blakiston's Son & Co., 1905.

Written for students of medicine, this book is a clear and concise exposition of the principles of physiologic chemistry, and places this complex subject in a very clear light, being purposely made elementary. Examples and exercises are introduced in smaller type, thus furnishing the basis for a laboratory course. Under the consideration of the blood are given some of the chemie aspects of the problems of immunity. The book contains 410 pages of text and 32 illustrations. We regard it as a very good student's textbook.

A Compend of Medical Chemistry, Inorganic and Organic, including Urinary Analysis.—By HENRY LEFFMANN, A.M., M.D. Fifth edition, revised. Philadelphia: P. Blakiston's Son & Co., 1905.

It is not often that a book of the apparent character of Leffmann's "Compend of Medical Chemistry" is so thorough, so clear, and so authoritative as the volume under review. Regarding compends in general, we may quote from the author's preface: "It may be said of compends that they are books that most professors and reviewers condemn and that nearly all students use. The truth is that in the present systems in professional schools students are obliged to meet two distinct requirements. They must study for the knowledge necessary for the practice of the profession, and they must study to pass examinations. The latter are, in so many cases, arbitrary in scope and affected by the personal equation of the examiner that the student cannot be blamed for resorting to a concise presentation of the more important facts of the science, supplementing this by notes of the narrower and more strictly personal items of the teaching." Especially to be commended is the fact that the little book holds in view the practical relation of chemistry to medicine, and selects its facts and illustrations accordingly. We can see uses for it not only by students, but by older physicians who have not been able to keep pace with modern chemistry as it has developed.

Materia Medica and Pharmacy.—By REYNOLD WEBB WILCOX, M.A., M.D., LL.D. Sixth edition, based on the fifth edition of White and Wilcox's *Materia Medica and Therapeutics*. P. Blakiston's Son & Co., Philadelphia, 1905.

This book has been revised to conform with the new United States Pharmacopoeia, but it retains all the good features which have heretofore won it favor with students of pharmacy as well as students of medicine. Its therapeutic recommendations are based upon experience, and, on the whole, are to be depended upon. If it errs at all, it is on the side of brevity.

AMERICAN NEWS AND NOTES

GENERAL.

Mexican Medical Congress.—The first Medical Congress ever held in Mexico City, convened last week. Much attention was given to sanitary science. President Diaz received the delegates to the Congress at the Castle of Chapultepec.

A Move for Cuban Sanitation.—President Palma has urged upon the Parliamentary Committee of the Moderate, or administration, party the necessity for granting a special appropriation by Congress for sanitary purposes. The members of the committee promised to take up the matter in the House of Representatives this month.

Youthful Marriages in Manitoba.—A marriage license recently reached the Department of Agriculture at Winnipeg from a Galician settlement, which gave the ages of both contracting parties as only 12 years, and as a result the legislature passed a bill amending the marriage laws so that no one can marry under 12, and up to the age of 18 the consent of the parents must be received.

"Malted Milk;" How to Obtain It.—A medical exchange gravely gives the following news item: "Goats to Furnish Malted Milk.—It is reported that the Department of Agriculture is to experiment in typhoid fever with the milk of goats recently imported from Malta. The goats were subjected to a rigorous quarantine and have been carefully inspected to determine their freedom from disease."

Urge a Health Portfolio.—The Legislative Council of the American Medical Association has adopted resolutions recommending a Department of Public Health be established with a representative in the Cabinet; the repeal of the canteen law; government control of the wandering tuberculous; the regulation of the practice of medicine at Hot Springs, Ark.; bespeaking the influence of the entire medical profession in securing uniform State laws regulating the manufacture and sale of patented and proprietary medicines, and asking the government to exclude from the mails and interstate commerce all remedies the constituents of which are kept secret.

Six-day Quarantine in the Canal Zone.—The canal zone medical authorities, considering that the zone is free from infectious diseases, has imposed a six-day quarantine and requires an inspection of all vessels from Bocas del Toro and Colombian and Venezuelan ports. Immunes and black Jamaicans are exempt from quarantine. The quarantine hospital is opened and the steamship agents at Bocas del Toro and at Colombian and Venezuelan ports have been instructed to collect fifty cents from each deck passenger and \$2 each from saloon passengers, for hospital fees. The steamship companies will be held responsible for the settlement of these dues.

Isthmus Health Report.—The December report of Dr. W. C. Gorgas, the chief sanitary officer of the Panama canal zone, says the sanitary conditions of the Isthmus are excellent. The last case of yellow fever in the city of Panama occurred November 11. The sick rate among the white employes is very low, but is high among the negroes, who are suffering from an epidemic of pneumonia. The yearly deathrate among the white employes is 8 per 1,000 and among the negroes 42. Dr. Gorgas gives as the reason for the difference in the rates the fact that the whites observe the sanitary regulations better than the negroes. The sanitary chief defends his methods from the attacks recently made on them.

EASTERN STATES.

For Protection of Food.—In order that the Massachusetts State Board of Health may have further power in protecting articles of food from gathering dirt and germs of disease by exposure to street dust, by contact with insects and diseased persons, the Woman's Health Club of Boston has prepared a bill which will soon be presented to the Legislature.

Erysipelas Germs in Money.—A case of erysipelas due, it is believed, to the sufferer coming in contact with money containing germs of the disease, is being treated at the hospital for contagious diseases at Lynn. The patient is a cashier in one of the large provision stores of that city. Her removal to the hospital was not at all compulsory, but was done simply as a matter of precaution.

Liquor Sales by Pharmacists.—A bill is before the Massachusetts House for legislation relative to the sale of intoxicating liquors by registered pharmacists in no-license cities and towns. It provides that they may sell them upon the prescription of a registered physician practising therein, that no such prescription shall be re-filled, that such prescriptions shall be retained and kept on file, together with the name of the person for whom they are filled, and that the police authorities and police officers of the town shall at all times have access to such prescriptions and names. A penalty of not less than \$50 nor more than \$100 is prescribed.

Race Suicide.—Representative W. L. V. Newton, of South Boston, has had drawn up and will present in the Massachusetts Legislature a resolution to provide for the appointment by the Governor of a commission to consider the matter of race suicide. The resolution asks that a commission of three persons be appointed by the Governor to consider what steps can be taken to counteract the tendency known as race suicide, and especially to prevent discrimination by landlords against tenants with children. The commission shall consider what, if any, legislation in the premises is expedient or possible, and what means, if any, might properly be taken by the commission to arouse public opinion in respect to the aforesaid evils.

NEW YORK AND VICINITY.

Harvey Society.—The sixth lecture in the course will be given at the New York Academy of Medicine on January 27, at 8.30 p.m., by Professor Llewellys F. Barker, of Johns Hopkins University. Subject, "The Neurons."

To Abolish Death Penalty.—Assemblyman Eagleton, of New York, has introduced a bill to abolish capital punishment and substitute therefor imprisonment for life. It is considered to have a direct bearing upon the renewed agitation over the case of Albert T. Patrick.

Drug Men Oppose Heyburn Bill.—At the annual meeting of the Drug Trade Section of the New York Board of Trade and Transportation, the Committee on Legislation was instructed to oppose the passage in Congress of the Heyburn Pure Food bill, or of any measure containing similar provisions.

The Gibbs Memorial Prize of the New York Academy of Medicine.—In addition to and as a partial correction of the statements published in the early December issues (1905) of all the large medical weeklies of the United States concerning the Gibbs memorial prize essays on the "Etiology, Pathology, and Treatment of the Diseases of the Kidneys," the trustees of the New York Academy of Medicine announce: 1. The prize amounts to \$2,000 this time. 2. The prize essays may be handed in October 1 (not January 1), 1907, or before that date. 3. The prize committee does not expect the "etiology, pathol-

ogy, and treatment" of the diseases of the kidneys to be discussed with equal completeness, but will be satisfied with the thorough scientific consideration of part of the problem, provided an essay offered in competition contains new facts or discoveries or points of view of sufficient merit.

Pupils May Avoid Vaccination.—Assemblyman Patton, of Erie, has introduced a bill into the New York House providing that no child shall be debarred from attending school because it has not been vaccinated, if the parents or guardians shall make a statement that they are of the belief that vaccination would be prejudicial to the health of the child.

Diphtheria Closes Staten Island School.—The Board of Health of Stapleton, L. I., ordered the public school at Linoleumville closed, because of several cases of diphtheria in the vicinity. Inspector Sprague sent all the pupils home, and with a corps of men fumigated the building. A teacher in the school was removed to the hospital, suffering from diphtheria. An Italian boy in the school first caught the disease and then the teacher was taken ill. Another case has been reported.

PHILADELPHIA, PENNSYLVANIA, ETC.

Women's Hospital's Big Year.—Reports read at the annual meeting of contributors showed that 24,091 cases of all kinds were treated during 1905 at the Women's Hospital, Philadelphia. The hospital has been endowed with several beds and received in cash over \$51,000 during the year.

Medical Club's Officers.—The following officers were elected at the annual meeting of the Medical Club of Philadelphia. President, Dr. Roland G. Curtin; vice-presidents, Drs. W. Sinkler, Henry Beates and M. B. Hartzel; secretary, Dr. J. G. Taylor; treasurer, Dr. Louis Adler, Jr.; governor, Dr. G. G. Davis; executive committee, Drs. H. H. Whitcomb, of Norristown; Emery Marvel, of Atlantic City; Wilmer Krusen, E. E. Montgomery and Ernest Laplace.

Measles Becomes Epidemic in Philadelphia.—Typhoid fever cases last week showed a decrease in number of 27, as compared with previous week, and the health authorities are hopeful that the disease is on the wane. On the other hand, measles again showed a large increase, and the reports returned cases from every ward in the city with the exception of one. Director Coplin says that some at least of the apparent increase is due probably to the fact that the new health law requires measles among the transmissible diseases physicians are required to register.

SOUTHERN STATES.

Smallpox Subsiding.—The smallpox scare in Spottsylvania county, Va., is subsiding. Quite a number of persons are in quarantine, but no new cases have developed. Many people have been vaccinated and the physicians are still busy in that line.

WESTERN STATES.

California State Institutions.—The State Board of Charities reports the following number of inmates in the various institutions of the State: State Hospital at Stockton, 1,099; at Napa, 1,491; at Agnews, 1,063; at Mendocino, 667; and in southern California, 833.

News from the West Coast.—Southern California Medical College is to have a new \$25,000 library, given by Dr. Jarvis Barlow.—St. Luke's Hospital, San Francisco, will have a \$50,000 maternity wing. Work will start at once on the building.—Articles of incorporation have been filled in Los Angeles for a hospital for the relief of tuberculous Hebrews.—Mrs. Millicent Olmstead, of San Gabriel, Cal., has deeded \$200,000 worth of property for the purpose of establishing a free hospital.

FOREIGN NEWS AND NOTES

GENERAL.

Health Regulations of Brazil.—The Health Officer of Brazil expresses dissatisfaction with the results of his inspection of quarantine methods and facilities and of the way in which the health regulations of the republic are observed in the northern ports. He reports that the general health of northern ports is good, but that there is a good deal of smallpox and yellow fever in Manaoas, and that the latter malady is prevalent in Belem, the port and capital of Para.

London Proves Healthy City.—The annual report of the medical officer for the county of London shows that London is a healthy place to live in. Its marriage and birthrates, however, are extremely low. Indeed, in 1904 the birthrate was only 27.9 for every 1,000 persons, this being the lowest recorded rate since the institution of civil registration. The marriage rate further declined from 17.5 to 17 for each 1,000 persons living. The deathrate for the year was 16.1 to the 1,000, which is much below the average of the previous 10 years.

OBITUARIES.

Swan Moses Burnett, aged 59, January 18, at his home in Washington, D. C. Dr. Burnett had been ill with an organic affection of the heart for some months, but the immediate cause of death was edema of the lungs. He was graduated from Bellevue Medical College Hospital in 1870, and later took a postgraduate course in ophthalmology in Europe. In 1879 he was appointed to a professorship in the Georgetown University, Washington, D. C., which post he held up to the time of his death. He also held a professorship in the Washington Postgraduate Medical School; was one of the founders of the Emergency Hospital, Washington, and for many years president of the attending staff of physicians; also a member of the staffs of the Providence and of the Children's Hospitals, and ophthalmic surgeon to the Central Dispensary in Washington. He was a member of the Washington Academy of Science and various other medical societies. He was the author of a "Treatise on Astigmatism," and contributed many chapters to textbooks on diseases of the eye and ear.

John Martin Klinck, aged 22, January 19, from malignant scarlet fever, at the Kingston Avenue Hospital for Contagious Diseases, Brooklyn, N. Y. He was a recent graduate, having obtained his degree at a southern college. Coming to New York to obtain hospital experience, he entered the Contagious Hospital on January 8.

Frank H. Caldwell, January 20, from Bright's disease, at his home in Tampa, Florida. He was graduated from Jefferson Medical College, Philadelphia, in 1880, and had been in practice in Florida for over 20 years. For a number of years he was chief surgeon for the Plant System in Florida.

William B. Neftel, aged 76, January 20, at his home in New York. He was graduated from the University of St. Petersburg in 1852. During the Crimean war he served as surgeon to the Russian Imperial Guards, and in 1865 came to the United States.

James H. DeWolf, January 17, at his home in Baltimore, Md. He was graduated from the University of Pennsylvania in 1878, later taking a postgraduate course in Europe. He had practised in Baltimore for 20 years.

Hannibal Hamlin, aged 58, January 19, from peritonitis, at his home in Orono, Maine. He was graduated from the Medical School of Maine, at Bowdoin College, Brunswick, Maine, in 1872.

Simon G. Miller, aged 59, was run over by a train and instantly killed, January 17, near his home at Palatka, Fla. He was graduated from Bellevue Medical College in 1874.

Richard Armstrong Heath, aged 42, of Buffalo, N. Y., January 17, at the St. Luke's Hospital, Buffalo. He was graduated from Edinburgh University in 1892.

Isaac Cooper, January 17, from apoplexy, at his home in Trenton, N. J. He was graduated from Hahnemann Medical College, Philadelphia, in 1868.

William E. Hodges, January 16, at his home in Ellicott City, Md. He was graduated from the University of Maryland School of Medicine in 1856.

Frank Parker Perry, aged 55, January 14, at his home in Bucksport, Me. He was graduated from Long Island Hospital College, Brooklyn, in 1873.

Henry St. John, aged 80, January 16, at his home in Alexandria, La. He obtained his medical degree in England.

Philip S. Orndorff, aged 72, January 16, from paralysis, at his home in Rio, Hampshire county, W. Va.

Walter Hurt, aged 30, of Belmont, Ontario, Canada, January 18, at the General Hospital, Belmont.

Dr. Emes, January 15, from diabetes, at his home in Niagara Falls, N. Y.

THE PUBLIC SERVICE

Changes in the Medical Corps of the U. S. Army for the week ended January 20, 1906:

First Lieutenant **JOHN A. CLARK**, assistant surgeon, leave granted December 19 is extended one month.—**ALBERT H. EBER**, contract surgeon, will proceed from St. Clair, Mich., to Fort D. A. Russell and report to the commanding officer, sixth battalion of field artillery, for duty to accompany that command to the Philippine Islands. Upon arrival at Manila Contract Surgeon Eber will report to the commanding general, Philippines Division, for assignment to duty.—First Lieutenant **JAMES BOURKE**, assistant surgeon, is relieved from further duty at Fort Sheridan, Ill., and from temporary duty at the medical supply depot, New York City, to take effect upon the expiration of his present leave, and will report for duty as surgeon of the transport Kilpatrick.—The following changes of station of medical officers are ordered: Captain **George J. Newgarden**, assistant surgeon, will report at Cuartel Melsic, Manila, for duty, relieving First Lieutenant Gideon McD. Van Poole, assistant surgeon, who will proceed to Camp McGrath, Batangas, and report for duty.—First Lieutenant **JAMES F. HALL**, assistant surgeon, having completed the duty for which he was ordered, will return to his proper station. Leave for ten days is granted Lieutenant Hall.—First Lieutenant **GEORGE H. SCOTT**, assistant surgeon, is relieved from duty in the transport service, and will proceed to Fort Duchesne for duty.—**HENRY M. HALL**, contract surgeon, now in San Francisco, Cal., will proceed to his home, Cedartown, Ga., for annulment of contract.—**HENRY M. HALL**, contract surgeon, is granted leave for two months.—Major **EDGAR A. MEARNS**, surgeon, is relieved from duty in the Department of Luzon and will report to the chief surgeon of the Philippines Division for duty in his office.—First Lieutenant **ROBERT L. CARSWELL**, assistant surgeon, is granted leave for one month and ten days, with permission to visit China and Japan, effective about January 15.—Orders relieving Major **EDGAR A. MEARNS**, surgeon, from duty in the department of Luzon and assigning him to duty in the office of the chief surgeon of the Philippines Division are revoked.—Major **HENRY S. T. HARRIS**, surgeon, having arrived

on the transport Sherman, will proceed to Iloilo, Panay, reporting to the commanding officer, Department of the Visayas, for duty.—First Lieutenant **WILLIAM E. VOSE**, assistant surgeon, having arrived on the transport Sherman, will proceed to Borongan, Samar, for duty.—First Lieutenant **JOHN W. HANNER**, assistant surgeon, is relieved from duty at the division hospital, Manila, and will report to the commanding officer, transport Seward, for duty thereon as transport surgeon, with station in Manila, vice First Lieutenant Charles F. Morse, assistant surgeon, relieved.—Lieutenant Colonel **WILLIAM H. CORBUSIER**, Deputy Surgeon-General, will be relieved from duty in the Philippines Division in time to proceed on the transport scheduled to sail about January 25 to San Francisco, Cal., reporting by telegraph to the military secretary of the army for instructions.—Major **WILLIAM D. CROSBY**, surgeon, will be relieved from duty in the Philippines Division in time to proceed on the transport scheduled to sail about February 15 to San Francisco, Cal., reporting by telegraph to the military secretary of the army for instructions.—First Lieutenant **WILLIAM T. DAVIS**, assistant surgeon, is granted leave for three months, with permission to return to the United States via Europe, effective upon his relief from duty in the Philippines.—First Lieutenant **CHARLES N. BARNEY**, assistant surgeon, now at the general hospital, Fort Bayard, N. M., will report for duty.—Captain **THOMAS J. KIRKPATRICK**, assistant surgeon, having reported his arrival at San Francisco in compliance with orders heretofore issued, will proceed to Fort Moultrie, S. C., and report in person to the commanding officer for duty.—**JAS. B. HALLWOOD**, contract surgeon, is granted leave for two months.—First Lieutenant **WILLIAM H. MONCRIEF**, assistant surgeon, having reported his arrival at San Francisco, Cal., in compliance with orders heretofore issued, will proceed to Fort McPherson for duty.

Changes in the Public Health and Marine-Hospital Service for the week ended January 17, 1906:

L. L. WILLIAMS, surgeon, directed to proceed to Wilmington, N. C., for the purpose of making an inspection of the station.—**W. G. STIMPSON**, passed assistant surgeon, granted leave of absence for one month from January 15, 1906.—**L. E. COFER**, passed assistant surgeon, granted leave of absence for 20 days from January 19, 1906.—**TALIAFERRO CLARK**, passed assistant surgeon, directed to proceed from Philadelphia to Easton, Pa., for special temporary duty, upon completion of which to rejoin station.—**T. F. RICHARDSON**, passed assistant surgeon, granted leave of absence for seven days from January 13, 1906.—**W. W. KING**, passed assistant surgeon, relieved from duty at San Juan, P. R., as chief quarantine officer, and directed to proceed to Washington, reporting at the Bureau for orders.—**J. M. HOLT**, passed assistant surgeon, granted leave of absence for two months from January 15, 1906, on account of sickness.—**J. T. BURKHALTER**, passed assistant surgeon, granted leave of absence for one month from January 24, 1906.—**L. P. GIBSON**, acting assistant surgeon, granted six days' leave of absence from January 16, 1906.—**W. L. STEARNS**, pharmacist, granted seven days' leave of absence from January 13, 1906, under the provisions of paragraph 210 of the regulations.

Changes in the Medical Corps of the U. S. Navy for the week ended January 20, 1906:

JOHN E. PAGE, passed assistant surgeon, ordered to the Franklin, Norfolk, Va.—**H. G. BEYER**, medical inspector, detached from the Wisconsin and ordered to the Ohio.—**G. H. BARBER**, surgeon, detached from the Ohio and ordered to the Wisconsin.—**J. C. THOMPSON**, surgeon, detached from the Lawton and ordered to the Cincinnati.—**W. H. BUCHER**, surgeon, detached from the Cincinnati and ordered to the Lawton.

SOCIETY REPORTS

WESTERN SURGICAL AND GYNECOLOGICAL ASSOCIATION.

Fifteenth Annual Meeting, Held in Kansas City, Mo.,
December 28 and 29, 1905.

[Specially reported for *American Medicine*.]

[Concluded from page 89.]

The Choice of Ligature and Suture Material in the Surgery of the Peritoneum.—H. G. WETHERILL (Denver, Colo.) stated, among other things, that he would no longer use nonabsorbable ligature or suture material for purely serous surfaces. The absolute sterilization of catgut was no longer difficult, and it was now realized that so-called catgut infections usually had their origin in a contamination of the gut through handling or in allowing it to come in contact with unclean surfaces or substances in or about the wound. Then, too, the chromicizing process prolonged the life of even the smaller strands to any desired time, providing the mucous surfaces or secretions were not in contact with it. These features made of catgut an ideal suture and ligature material for intraperitoneal use, and all that became necessary was the exercise of due care and skill in the selection of the catgut and the application of sutures and ligatures and the making of knots. So far he had had the good fortune never to have had a secondary hemorrhage or other accident from the use of catgut, either in the way of a slipping knot or a too rapid absorption, and he believed this immunity from accident to have been due to the exercise of extreme care in its application. For about three years he had had great satisfaction in the use of the Downes electro-thermic cautery clamp in selected cases, thus doing away with all ligature and suture materials around pedicles. For vaginal hysterectomy, particularly in cancer of the uterus, it was ideal. It promoted rapidity and safety in the work, and without doubt gave much greater security against the danger of recurrences in early cases. There was, in his experience and judgment, no doubt that patients operated upon with the Downes clamp by either the vaginal or abdominal routes had smoother and more rapid recoveries, and above all, a very noticeable freedom from the intense pain and backache so common after all pelvic operations, when the terminal nerves of this region were left for days or weeks in the bight of a securely tied ligature or closely applied suture. He had had one or two experiences with the Downes clamp, however, which led him to believe that there was increased danger from thrombosis and embolism after its use, occasionally occurring several weeks after operation, and until this doubt was settled, he would be most careful in the selection of the cases upon which it was used.

Talipes Calcaneus.—A. F. JONAS (Omaha, Neb.) described a plastic operation for the permanent relief of cicatricial talipes calcaneus.

The Treatment of Varicose Veins.—C. H. MAYO (Rochester, Minn.) said that the various operations in use at the present time were necessary, from the diverse conditions and symptoms manifested by the disease. The condition was probably from a defect in the vein walls, valves, or enervation. The Trendelenburg operation was deservedly popular, especially for cases of vicious venous circle of the deep and superficial vein of the thigh. Enucleation of the veins in a subcutaneous manner through several short incisions was a satisfactory treatment for the majority of cases. The subcutaneous removal of the internal saphenous from above at the side of and below the knee, by destroying the main superficial channel and deep communicating branches, was the best method, accomplishing in one

operation all that could be obtained by either the Trendelenburg above or the Schede below. Goerlid's report showed 84% of operations as satisfactory and 16% as failures. From experience in 184 cases this seemed a fair statement of the late results from the various methods employed at present, except in the percentage of failures; 16% was too high, as many of those not satisfactory were much improved over their former condition.

[To be continued.]

THE SOUTHERN SURGICAL AND GYNECOLOGICAL ASSOCIATION.

Eighteenth Annual Meeting, Held in Louisville, Ky.,
December 12, 13, and 14, 1905.

[Specially reported for *American Medicine*.]

[Continued from page 88.]

Foreign Bodies in the Esophagus.—STUART MCGUIRE (Richmond, Va.) said that the diagnosis of foreign body in the esophagus was based on the history of the case, the external palpation of the neck, the passage of an esophageal bougie, and finally by the use of the röntgen ray. The character and location of the foreign body being determined, the practical question was how to remove it. If it was round or smooth, efforts should be made to extract it with forceps and probangs, or to make the patient eject it by swallowing masses of partially masticated food and then vomiting. If it be small, it might seem wise to endeavor to push it into the stomach. None of these expedients should be tried when the foreign body was pointed, sharp or angular. Under modern surgical technic an open operation was the safest procedure. There were two means of approach, one by an external esophagotomy, the other by a gastrotomy, and the selection of the method would depend on the location of the impaction. If it was opposite the cricoid cartilage, an esophagotomy should be done; if it was below the level of the supraclavicular notch, then gastrotomy should be performed. As an illustration of the operations of esophagotomy and gastrotomy, he reported two cases. In one, the patient, aged 10, while playing with a glass stopper, put it in her mouth and swallowed it. It lodged in the esophagus opposite the cricoid cartilage and produced complete obstruction. The foreign body was removed by an external esophagotomy. The second case, a baby aged 7 months, while being dressed, seized an open safety-pin and put it in its mouth. The mother, in her efforts to remove it, pushed it first into the fauces and then into the esophagus. The pin was removed in this case by a gastrotomy.

Discussion.—J. WESLEY LONG (Greensboro, North Carolina) narrated the case of a forty-six-day-old infant who had swallowed an open safety-pin; the pin lodged in the esophagus opposite the two cricoid cartilages. A radiograph, however, showed that the point of the pin was below the arch of the aorta. It produced constriction of the esophagus where the left bronchus crosses it, and the pin was removed by an external esophagotomy without any shock. He thought there were some cases in which this operation was preferable to gastrotomy. W. S. GOLDSMITH (Atlanta, Georgia) mentioned the case of a patient who had swallowed the concave part of a dental plate, which lodged in the esophagus and was retained there for a period of four months. At the end of this time patient was very much emaciated and weak. After locating the foreign body, efforts were made to extract it with forceps, but this could not be done. It then occurred to him to try Bull's method of attaching a series of sponges to a long silk ligature and using an esophageal bougie, passing it out through the mouth and leaving in position the series of sponges. After attaching the bougie, it was a simple matter by a few sweeping movements backward and forward to push the

foreign body into the stomach and extract it through the gastrotomy opening. The foreign body was of such consistency that the röntgen ray was of no aid. H. A. ROYSTER (Raleigh, North Carolina) reported the case of a child, aged two, who, two weeks previously to his seeing the case, had swallowed the wheel of a tin toy wagon. The child was able to swallow liquids, but not solids. During this time it subsisted on milk and liquid food. He used a medium-sized shotted semielastic bougie for the purpose of an examination; this passed into the esophagus, met with some resistance, after which he was enabled to pass it farther without obstruction apparently. After applying a mouth-gag he was enabled to extract the foreign body with an esophageal forceps. The foreign body lay transversely across the esophagus. J. SHELTON HORSLEY (Richmond, Virginia) said if a foreign body could not be removed by ordinary means, no time should be lost in resorting to early operation. He reported the case of a child who had swallowed a camel from a grab bag. The child put it into its mouth; it was situated a little lower than the level of the larynx. He tried to extract it by several different methods, but was unsuccessful. He saw the child on the fourth day after it had swallowed the foreign body; did an esophagotomy, and removed it with comparative ease. The esophagus was injured and gangrenous. Septic symptoms developed, and the child died on the fourth day following the removal of the foreign body. He thought the child's life might have been saved by an earlier operation. CHARLES M. ROSSER (Dallas, Texas) reported two cases of foreign bodies in the esophagus. In one, the foreign body, an ordinary pin was located by the röntgen ray, but could not be removed by ordinary means. Two-thirds of the pin was buried, but with the aid of the fluoroscope the pin was caught by its head, and with forceps, extracted. In the other case, a child, a nickel was located within two or three inches of the cardiac end of the esophagus. Gastrotomy was performed, and the foreign body extracted. The child lived about 6 or 8 hours, then died, apparently without shock. RUFUS B. HALL (Cincinnati, Ohio) reported the case of a child of a physician, five months old, who swallowed a safety-pin an inch and a half long. It remained in the esophagus for a time, but at the end of 24 or 36 hours the symptoms caused by its presence disappeared. The child was able to take the breast and thrived well. A röntgen-ray picture was taken which disclosed an open safety-pin in the pyloric end of the stomach. Parents declined an operation for its removal until unfavorable symptoms developed. Several röntgen-ray pictures were taken; but the child did not develop any unfavorable symptoms referable to the presence of the safety-pin. When the child was 26 months old, it passed the pin by the natural route. The child is now 7 years old. W. D. HAGGARD (Nashville, Tenn.) related the case of a child 18 months old, who swallowed a pin, the head of which was as large as a cherry seed. The child developed cough, and the presumption was that the pin had lodged in a bronchus. A röntgen-ray picture threw very little light in regard to the presence of the foreign body. The pin appeared to be in a bronchus, with its head down and to the left. The child had little or no pulmonary symptoms, to justify him in doing an operation. At the end of 10 days another röntgen-ray picture was taken, but the symptoms were so slight that operation was deferred. Four days later another radiograph was taken, which failed to locate the pin, and shortly after this the child passed the pin by the natural route. McGUIRE, in closing the discussion, said no hard and fast rules could be laid down as to whether esophagotomy or gastrotomy should be done in a given case. Of the two operations he preferred to do gastrotomy. It seemed easier and the after-treatment was simple. If it was equally applicable, it was the method to be adopted.

[To be continued.]

CLINICAL NOTES AND CORRESPONDENCE

[Communications are invited for this Department. The Editor is not responsible for the views advanced by any contributor.]

THE EFFECTS OF TROPICAL LIGHT.¹

BY

MAJOR CHARLES E. WOODRUFF,

Surgeon, United States Army, Plattsburg Barracks, New York.

To the Editor of *American Medicine*:—I enclose a copy of a letter sent to the *Journal of Tropical Medicine* to resent a misleading book review containing many nonsensical misquotations. This is a matter which vitally touches every physician in the civilized world. When a book is reviewed it is essential that the statement of its contents shall be correct, no matter what may be the reviewer's opinion of their value. It is desired to call wide attention to this dreadful injury to medical journalism, and I would be pleased to have you publish the letters, to put upon such practices the stamp of stern disapproval.

To the Editor of the *Journal of Tropical Medicine*:

In reply to your letter expressing a desire to publish an answer to Colonel G. M. Giles' adverse criticism (*Journal of September 1*) of the theory that light is a good stimulant if taken in moderation, but harmful in excess, I must say that I find it extremely difficult to do so without quoting my book in full. He has said so many things which are not found in the book that it is quite evident he has not read it understandingly. His intemperate remarks also show such a lack of the judicial temperament needed in a reviewer as to detract from their value as controversial, even if they were correct.

A discovery which runs counter to long excepted theories is rarely received without strong protest from the unprogressive element and the senile. It has been said that Jenner's theory was never accepted by any physicians who were over 40 at the time of its promulgation, and we all know the dark history of the attacks upon the theory of the infectious origin of puerperal septicemia, attacks made by scientists entrenched in official positions. New ideas must wait for recognition until the young men grow into authority. There is much truth, then, in the old saying that it requires 20 years for a true but heretic idea to become orthodox, excepting, of course, those which emanate from the orthodox teachers themselves. Yet it is astounding that such an important matter in tropic hygiene as von Schmaedel's theory of the use of skin pigmentation should not have been put to practical use by English surgeons in India in all these years since it was first announced. It is really a great blot upon tropic medicine and its alleged progressiveness.

Colonel Giles is naturally reluctant to confess that he has been wrong all his life in advocating to his patients a harmful degree of light, and that's where the shoe pinches in America, too. His statement, that something which is new to him is mischievous, proves that the British nation is to be congratulated upon its wisdom in establishing a retired list for those who have been bombarded by tropic light too many years. I am very much of the opinion that the American plan of keeping troops but two years in the tropics is the wisest, for I am afraid that twenty years in its dazzling light would entirely blind us to its dangers, and make it necessary for us also to retire after that length of service for escape to cloudier climes to educate our children.

Two Frenchmen have recently written upon the subject of the damage done to living protoplasm by light, and their articles in *Cosmos* and *La Nature* are being quoted in America. Perhaps some English writers will now begin "to set up and take notice"

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also. It won't do to let the French steal our thunder this way.

In regard to the general law that in Europe the proportion of brunets and the degree of their pigmentation increase with the mean annual sunshine, it is only necessary to compare Bartholomew's maps of cloudiness and Ripley's maps of complexions to see that it is a law. The Colonel does not seem to have done this. There are other laws of course—such as the increase of blondness with elevation (excepting on treeless plateaus) and its increase with latitude, but these do not alter the fact that the most blonds are in the cloudiest places of Europe. Colonel Giles states that he can see no such law in the British Isles. His view is so intensely provincial that, as an American, I rise to remark that his little islands occupy but a very small spot on the map of Europe. What they reveal as to clouds and complexions has no bearing upon a law which takes in the British nation's average as only one very small item in the whole. The Colonel apparently thinks that Europe consists of London and a bit of continent around it.

His statements that the speculations on the origin of blondness are based on the old ideas when ethnology was regarded mainly from the philologic standpoint, is the exact opposite of the stated facts, which he has evidently overlooked. I am sorry also to see that he has not kept in touch with the newer anthropology, which has so radically modified the old ideas of the place of origin of the anthropoids and of man. If some changes of environment caused the anthropoids to evolve into man, surely no one except Colonel Giles can expect to find the anthropoids still there. He cannot have his cake and money, too. Man must have originated in some place where there are now no anthropoids and that place is not in the tropics. The men of the tropics are now generally believed to be descendants of immigrant types. He also states that it is surprising that negroes should be evolved from white men; I am surprised, too, for it is nowhere stated in the book. His surprise that the Aryans were blond is quite conceivable, for it is a very old and resistant theory of some of the most learned anthropologists. I also notice his references to blond races in the tropics, but need only mention that these types are now known to be well pigmented and far from blond. His theory that the color of man's retreating rear view was originally evolved to make him resemble his background while hiding from enemies perhaps, as in the case of some of the lower animals, is exhilarating to say the least, and adds to the gaiety of nations. Science, without such humor, is too slow entirely.

The book mentions that some light is probably necessary for man, even if it is not needed by the majority of the lower animals, and it distinctly states that dark houses are harmful, but not as harmful as those which are "light baths." It also states that the amount of light in a school-room should be sufficient for good vision. Nevertheless he says, "regardless of the evil effects of eyestrain, he considers light school-rooms objectionable, even in temperate climates," an astounding evidence of a vivid imagination. Where did he get it? He also deplors the absence of experiments on the relative penetrability of the tissues to light, but as such experiments are mentioned, it is evident that Colonel Giles has not even read parts of the book he has the temerity to criticize.

This is a dreadful situation for medical literature. What are the professional readers of your journal to expect in future reviews—truth or misstatement. In the name of tropic medicine I must express regret that a journal devoted to this science should have found space for an unfair and mischievous article which so greatly misquotes, and which then proceeds to demolish ideas which are not in the book or theory it purports to review. More careful study would have prevented this check to the acceptance of what is now proving to be of great importance. It is conservatism with true Anglo-

Saxon obstruction. The work was sent to Colonel Giles to be reviewed, for it is extremely important to learn of errors of fact or conclusion in the work, but it is a bootless task to reply to criticisms of what is not said in it.

I can only recommend to Colonel Giles that he read something of the new uviol lamp of Doctor Schott, of Jena, a lamp which gives a cold light, devoid of red and infrared rays, but rich in ultra violet. Its deadly effect upon living organisms is so startling that he should stand aghast at having recommended so much of a deadly agent to poor unprotected skins. But as he wants ocular proof that a black skin is more opaque than that of a blond Scandinavian—a matter most of us consider axiomatic—I am afraid he is a doubting Thomas, who will not believe he has brains because he has never seen them.

I am astounded to learn that the experiment of continuous residence of Europeans in the tropics has never been fairly tried—shades of Goths and Vandals! groan in your premature graves!—and I am doubly astounded that I have said "that big men are found only in cold, gloomy climates." I thought that they were found in other places besides Great Britain. He should study the great natural law described in *Science*, November 24, 1905, by J. A. Allen, that in nearly every genus of mammal or bird the species nearest the equator is smallest, and in every species the individuals decrease in size toward the equator also.

I also note that Colonel Giles in his own book on the tropics is a strong advocate of the belly-band to prevent intestinal infections. The great majority of American physicians have a suspicion that this is the wrong place for a filter, and that it has no effect whatever on cholera vibrios we swallow. So it is evident that we look at the world through different eyes—perhaps in America we have more light, which might injure us, no doubt, but we die seeing, and after all that might be better than a long ignorant life in the darkness of London's fogs. The statement that Persia is perhaps the sunniest country in the world is sure to make our Southern California citizens froth at the mouth. Away with such heresy!—we have a monopoly on sunny climates—it's our 'obby.

Colonel Giles also states that sufficient prominence is not given to the fact that light is therapeutically useless except in quite superficial lesions. This is a well-directed criticism and I am truly sorry for the mistake. To be sure, the fact is mentioned several times—which was considered enough for American readers—but if I had realized the darkness of London and the difficulty of seeing what is mentioned several times, I would have printed it on every page of the edition intended for London consumption.

"In conclusion, let me express to" Colonel Giles "my regret in being unable to find myself in agreement with" his dreadful mistakes, "*but magna est veritas et praevaleret* is, it cannot be doubted, as much his guiding principle, so that I feel sure he will in no way resent what, after all, is" merely the defense of a great law of extreme value to the newer tropic medicine for which he will never have further practical use in London fogs.

It is to be hoped that the British troops in India will not take as many generations to learn and profit by this law as they were in discovering the cure for scurvy or in learning that uniforms suitable for Scotland are not quite the thing for equatorial regions. We expect to take the lead, for as early as 1950, if we live that long, we will find that Americans in the tropics are taking note of the matter. Many of them have not even heard of it yet. Somewhere along in the twenty-first century our climatologists will hear of it—at present they do not know anything of this part of their special science. Their journals do not mention it, and those men who review climatologic literature for scientific journals haven't yet waked up. The weather experts are beginning to stir and may yawn soon. Perhaps along in the next generation the school of tropic medicine in London fogs,

will look up from the microscopes long enough to study the effects of tropical light, so that its students will go forth knowing something of the subject. Of course they haven't sufficient light in London to investigate the matter, but they might read of investigations made elsewhere—perhaps.

The medical profession working in the tropics should not wait for the official scientist but study the matter at once. Colonel Giles himself should try to explain why tuberculosis is best cured where the sun never shines, and why the death and sick rates of American soldiers are at their lowest in the cloudiest and rainiest parts of this country as shown in the last report of the Surgeon-General. If it is due to protection from too much light, it is really next to murder to advocate the old theory of excessive exposure of our patients. Perhaps it is merely perversity which induces them to die in sunny climes, to spite our old theories.

I do not remember ever having read a review containing so many garbled and erroneous statements as are found in the four columns written by Colonel Giles. The matter should be resented by the medical profession, as the injury done to it deserves the severest condemnation. In a letter Colonel Giles says: "But I don't count reviews much—I used to earn an odd guinea now and again at that, when I was but a student, and I often grin at the memory of the way I used to criticise what I understood nothing of. Of course, unless the editor marked [or mailed, C. E. W.] it for damning, I was always on the safe, laudatory side." In his old age is Colonel Giles still deliberately criticising what he understands not, or is he unable to understand it, or did you, Mr. Editor mark the matter for damning? In either case, the *Journal of Tropical Medicine* is in a dreadful position, if it is doing anything to continue the destruction of the health of British soldiers in the tropics. A little more editorial discretion would have been a benefit to that part of your nation compelled to leave the protection of the clouds and fogs they love so well, and reside a short time in the tropics.

There was a time, Mr. Editor, when Englishmen could see nothing good in America. The pains left by the bruises of our Revolution lasted a long time, but we had hoped that the dependence of England upon America for her food had smoothed your ruffled feathers. Our statesmen prate of our new international friendship—our politicians deny it. Are the latter correct? Is there still a remnant of the old hostility which gives you such a high degree of mental astigmatism that you can see nothing straight in America? If there is, it's your own loss. May God help your soldiers in the tropics, if your doctors won't.

Dr. Allan McLane Hamilton, one of the leading neurologists of America, writes me: "I can confirm what you say about the undesirability of a 'sunshiny' place for blonds. For five summers I lived in Capri and my experience was that northern people of the nonpigmented type were nearly always 'nervous' and did not do well. When there was a psychopathic temperament it was aggravated." . . . "For many years I have advocated the use of the darkened room for several hours daily, with a few hours of cheerful sunshine (for the psychic effect) in my 'rest cases' and they have improved when they would not under the conventional and popular treatment of 'plenty of sunshine and fresh air.'" And yet Colonel Giles has the audacity to intimate that it is "mischievous" to cure people in this way—by removing one cause of the illness.

It is interesting to note that as early as 1817 the value of darkness in the rest treatment of neurasthenic conditions was noted by a London physician, Dr. G. R. Rowe, F.R.C.P., and F.R.C.S., in a little book on hypochondriasis. He did not know neurasthenia by that name—many European physicians do not even yet—and he mixed up dysentery and other things in his tropic cases and made many other curious errors even as late as the

sixteenth edition in 1860, but that does not alter the fact that in his neurasthenic cases he darkened the room to exclude "the rays of light from offensively acting upon the retina, and consequently, the sensorium commune" (page 43, second edition). This hint was thrown out 85 years ago and is not acted on yet—pretty good record for English physicians in India. It is to be hoped that they will hear of it in the next 85 years.

The *Indian Medical Gazette* of November, 1905, contains an editorial on the subject, and it must be considered pernicious by Colonel Giles. The younger element in Calcutta is waking up nicely—they have more light to see things than those in London. A few actinometric observations were made in Russia in 1891 and 1892, but beyond these and the observation of the average and total cloudiness, practically nothing is recorded as to the total amount and intensity of the light of any place in the world—a most astounding evidence of the lack of progressiveness of climatologists and meteorologists. Indeed, among the dozens of reviews of the book, the only flippant and childish one is by a certain C. Meriwether, in the *Geographic Magazine* of January, 1906. It has a value, nevertheless, as it is so stupid and shows such dense ignorance of the matter as to explain in full the backwardness of climatology. His belligerency can be excused on account of his name—it is a pugilistic clan—but his dreadful misstatements are unpardonable. It is fitting that such nonsense should appear in the *Geographic Magazine*, whose editorial staff consists mostly of official scientists—a class notorious for its hatred of new ideas from outsiders. Hundreds of illustrations could be given of their opposition to scientific progress. Cuvier, when shown human fossils, pitched them out of the window, the English astronomer Royal contemptuously refused to look for the planet whose position was accurately calculated by an outsider, Owen marred a long career as a naturalist by opposition to organic evolution and by underhand denial of its evidence, and now comes that great expert—merry Meriwether, weather expert—with his inability to learn something new. We can almost hear him say "The sun do move." He's in good company with Cuvier and Owen, and the medical profession will treasure his review as a fine study of a reviewer's psychologic abnormalities. As the new ideas are being accepted, it is interesting reading matter already.

A CHISEL FOR OSTEOPLASTIC WORK ON THE SKULL.

BY

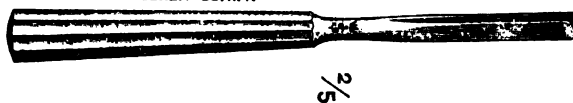
JOHN EGERTON CANNADAY, M.D.,

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During recent years various operations for the exposure of portions of the brain by means of the osteoplastic flap method have been devised, and as time has gone on, have become deservedly popular. In outlining these flaps after the soft structures have been cut through, the chisel, as a simple, straight-forward instrument, has perhaps been used more than any other

THE KNY-SCHEERER CO. N.Y.



device. With the ordinary chisel, in cutting a groove in the skull, one has to cut down on one side, then on the other to complete the channel. I have sought to expedite matters by devising a chisel with a V-shaped cutting edge. This makes a clean cut groove and saves time.

This instrument was made up for me by the Kny-Scheerer Company and is quite satisfactory in practice.

ORIGINAL ARTICLES

SOME PROBLEMS IN THE DIAGNOSIS AND TREATMENT OF PUERPERAL INFECTION.¹

BY

B. C. HIRST, M.D.,
of Philadelphia.

There is no problem in the whole realm of gynecology more important than the prevention, diagnosis, and treatment of puerperal infection. Pelvic and abdominal tumors, injuries of the birth canal, displacements of the pelvic viscera, nonpuerperal pelvic inflammations and the operative technic required for their treatment are subjects on which little remains to be said. But discouragingly little progress has been made in the prevention, the recognition and the cure of puerperal infection, though in frequency and danger it stands first, I think, among the diseases of women. Several factors have contributed to retard the advance in this department of gynecology that might have been expected in these days of asepsis. A large proportion of the women delivered in the cities are attended by midwives, with no knowledge of surgical cleanliness. A very large number of parturient patients are attended by physicians who practise no other branch of surgery but obstetrics and who have not therefore a clear conception of aseptic surgical technic. The surroundings and attendants of many patients make surgical or even ordinary cleanliness impossible. A certain proportion of childbearing women have an infected genital canal before labor begins, and may become septic afterward although the medical attendant, the nurse and the surroundings at the time of labor are irreproachable. It is not strange, therefore, that puerperal sepsis in general practice seems as rife almost as it ever was and that the advent of the antiseptic and of the aseptic era has had nothing like the effect in reducing morbidity and mortality after childbirth that it has had in other surgical procedures. Consequently the diagnosis and treatment of puerperal infection is an ever present problem in medical practice, usually fraught with anxiety, often obscure and difficult in the extreme. The subject is too large to discuss *in extenso*. I propose, therefore, to confine this article to a few phases of it, viz.: the bacteriologic examination of infected women as a means of precise and accurate diagnosis; the influence the results of this examination should have upon prognosis and treatment; the treatment of infection after labor by instrumental exploration and evacuation of the uterus; the present status of antistreptococcic serum as a curative agent; and, the lessons taught by practical experience in the operative treatment of puerperal sepsis by pelvic and abdominal surgery. These are the phases of the subject

on which at present there is the greatest difference of opinion.

The Bacteriologic Examination as a Means of Precision in Diagnosis.—During the 19 years since Gönner and Döderlein began the study of bacteria in the genital canal, there has been an enormous amount of work done in this field with the most disconcerting differences in results. As is well known, the following diverse opinions have their advocates: (1) The vagina is normally the habitat of a nonpathogenic bacillus, which is not only nonpathogenic but is actually inimical and destructive to pathogenic microorganisms; (2) the vagina may contain pathogenic microorganisms of diminished virulence, but capable under certain conditions of regaining their original virulence; (3) the vagina may contain any of the pathogenic microorganisms with their usual toxicity; (4) the vagina and cervical canal may contain microorganisms, nonpathogenic and pathogenic, but the uterine cavity, both in the nullipara and in the puerpera, is sterile; therefore if pathogenic microorganisms are found in the uterine cavity, the woman is infected; if the lochia after childbirth taken from the uterus are sterile she is not infected; (5) the uterine cavity may contain microorganisms of all sorts, including streptococci and other pathogenic germs, while the woman is in perfect health, the bacteria acting as saprophytes on the mucous membrane, not invading the underlying tissues and consequently not infecting the patient; (6) the uterine cavity may be sterile in the puerperium, but the patient may be desperately infected, the infection having originally occurred in the endometrium, but all trace of the infecting microorganism having disappeared from the original site of infection.¹ It is highly desirable for the practical physician seeking the aid of laboratory methods in diagnosis and treatment, that the truth should be elicited as speedily as possible from these apparently irreconcilable differences of opinion. For example, if it is true, as a number of specialists claim it is, that the uterine cavity in the puerperium is always sterile in the normal case; is always the seat of pathogenic microorganisms in an infected case; if the presence of pathogenic microorganisms in the uterus is a sure sign of puerperal infection; if their absence from the uterine cavity is a sure sign the woman is not infected, no matter what her symptoms, then the diagnosis of puerperal infection becomes one of the simplest problems in medicine and uterine cultures must be made in every doubtful case to solve it definitely. When this proposition was first advanced some years ago it seemed so convincing and logical that I adopted the method with enthusiasm, but it soon appeared unreliable. In demonstrating Döderlein's technic to classes of

¹ Read before the Cincinnati Academy of Medicine, December 11, 1905.

¹ A good review of the literature may be found in three recent articles: Brownlee, the "Germ Content of the Uterus and Vagina during the Normal Puerperium," *Journal of Obstetrics and Gynecology*, Brit. Empire, September, 1905; Natvig, "Bakteriologische verhältnisse im weiblichen Genitalsekret," *Archiv. f. Gyn.*, 76 Bd., 3 Heft, 1905, and Little, "The Bacteriology of the Puerperal Uterus," *American Journal of Obstetrics*, December, 1905.

students, on puerperal women without fever or other signs of infection, I was at first astonished and disappointed to receive reports from the laboratory of pathologic microorganisms in about a third of the normal cases, in spite of a scrupulously careful technic in obtaining the lochia. Similar results have been obtained by Stolz, v. Franqué, Franz, Burckhardt, Wormser, Schauenstein, Little and other competent observers, the percentage of infected lochia increasing as the puerperium advances. A recent series of observations just completed in the Maternity of the University of Pennsylvania¹ gave the same results, and in four cases in the last six months we have been able to demonstrate that the uterine cavity may be germ free although the patient has a general streptococcic infection following labor and probably originating in the endometrium. If it is true that a third or more of fever free puerperal patients may have pathogenic microorganisms in the uterus, and if a certain (in our statistics, a large) proportion of badly infected patients have no pathogenic microorganisms in the uterine cavity, it is impossible to place any reliance on uterine cultures in diagnosing puerperal sepsis, and to base one's treatment on a diagnosis made in this manner is obviously absurd. It would be a great pity, however, if twenty years' work on the bacteriology of puerperal sepsis should prove of no practical value to the clinician. But I do not believe that this will be the case. What we wish to know in puerperal sepsis is not whether there are pathogenic bacteria in the uterine cavity; there may or there may not be whether the patient is sick or well, and no human being can tell whether they are simply acting there as saprophytes or not. What we do wish to know is whether the system is invaded or not, and this information I believe we can obtain with a great degree of accuracy by blood cultures. Some six or eight months ago Dr. Joseph S. Evans of the Pepper Laboratory suggested that we begin a study of this subject systematically, taking a certain number of fever-free patients, but investigating most carefully the patients with symptoms indicating infection.

The following review of his bacteriologic work has been kindly furnished me by Dr. Evans:²

Of 35 cases which were studied, 25 were febrile and 10 afebrile—normal puerperium.

In 26 cases both the blood culture and the intrauterine culture were made.

In 3 cases the blood culture alone was made.

In 6 cases the intrauterine culture alone was made.

In 6 cases both methods gave positive results; of these, 5 were streptococcic infections and 1 was typhoid infection.

¹ In obtaining the lochia we have used the tube devised by Dr. Wm. R. Nicholson, consisting of a metal tube closed at its distal extremity by a lid with a catch; after this is inserted in the uterus a curved glass tube is passed through it, the cap is sprung loose and the glass tube enters the uterus uncontaminated.

² The detailed account of the technic employed and the results obtained will shortly be published by Dr. Evans in the Medical Bulletin of the University of Pennsylvania.

In 4 cases the blood culture gave positive and the intrauterine cultures negative results; of these 4 cases one patient was operated upon and multiple abscesses of the wall of the uterus were found. The endometrium was normal. One patient developed a severe streptococcic infection within a few hours after delivery, though she had never been examined at all. There was apparently a recovery by crisis after the use of antistreptococcic serum; a recurrence of symptoms after a five days remission with negative blood and uterine cultures, and ultimately a perfect recovery. One patient had a mild case of infection, subsiding spontaneously after a few intrauterine douches. It was the sort of case that clinically and as a result of uterine cultures would have been regarded as sapremic, but the blood cultures showed systemic infection. One patient had a virulent streptococcic infection with intraperitoneal suppuration, suppuration of the psoas muscle, suppurative nephritis and ultimately necrosis of the uterus. The woman died and the general streptococcic infection was verified at autopsy.

In 3 cases the blood culture alone was made and found to be positive. One patient was so weak that the intrauterine culture did not seem advisable. At autopsy, however, the streptococcus was isolated from the vagina, cervix, endometrium, broad ligament, and peritoneal cavity. The second patient had rather doubtful symptoms of septic infection. There was a history of an intrauterine application having been made following an abortion. No local manifestations in the pelvic organs could be found, therefore an intrauterine culture was not taken. The woman made a good recovery. The third patient was brought to a private room in the University Hospital 30 days after childbirth with an intraperitoneal abscess. Abdominal section was first performed, with drainage; then vaginal section with drainage of the pelvic connective tissue. Finally a cure by crisis was apparently secured by antistreptococcic serum.

In 15 cases both methods were negative; of these 11 were febrile.

Six were suspected cases of sepsis. Later developments showed: 1 to be scarlet fever; 1 to be malaria; 1 to be uremia; 1 to be salpingitis; 2 to be membranous vaginitis.

Five were postoperative cases. Local infection was found in each of these in the form of stitch abscesses. Three of these were afebrile. Normal puerperium.

In 2 cases the blood culture was negative and the intrauterine positive. One case was postoperative and there was a stitch abscess (perineal). One case was apparently a normal puerperium.

In 6 cases the blood culture was not taken and the intrauterine culture was negative. These cases were all apparently normal and were afebrile.

Of the 25 febrile cases: 12 positive blood cultures showed undoubted sepsis; 5 gave positive results by both methods; 4 gave positive results by blood culture but negative results by intrauterine culture; 3 gave positive results by blood culture, no intrauterine culture being taken. All of these cases were septic from the clinical standpoint. One positive blood culture showed typhoid fever. This case looked very much like sepsis.

Twelve negative blood cultures showed: Six cases to be local infections—postoperative. Three cases to be local infections—1 salpingitis, 2 membranous vaginitis. Two cases general infection—1 scarlet fever, 1 malaria. One case was uremia.

Of the 10 afebrile cases: Four blood cultures were negative. In 6 cases this method was not employed.

Of the 25 febrile cases: Twelve cases were undoubtedly sepsis; 5 positive intrauterine cultures confirmed this; 4 negative intrauterine cultures failed to show this.

In 3 cases blood cultures were not made. One case was typhoid fever; 1 positive intrauterine culture confirmed this.

Twelve cases were local infections (see above). Eleven negative intrauterine cultures confirmed this; 1 positive intrauterine culture was misleading.

Of the 10 normal afebrile cases: Nine negative intrauterine cultures confirmed this; 1 positive intrauterine culture was misleading.

Thirty-two intrauterine cultures were taken. The method failed to show septic infection in 4 out of 9 septic cases. It showed apparent septic infection in 1 out of 12 febrile cases in which general sepsis was absent. It showed apparent septic infection in 1 out of 10 afebrile (normal) cases.

On the other hand, 29 blood cultures were taken: Twelve showed the presence of *Streptococcus pyogenes*, and these cases were clinically sepsis. One showed the presence of *Bacillus typhosus* and the autopsy confirmed this finding. Twelve (taken in febrile cases) were sterile and later developments in the cases showed sufficient causes for the febrile condition. Four were sterile. These were taken in normal afebrile cases.

In the series, the blood culture did not fail in a single instance as a method of precision in diagnosis. The intrauterine method, however, failed to show sepsis in 4 out of 9 cases and, if the method has been relied upon, indicated septic infection in 2 cases which were practically normal.

The influence that the bacteriologic examination of a supposedly infected woman should have upon diagnosis and prognosis can be estimated in part by what has already been stated and must in part be judged by clinical experience. The findings by the examination of the lochia cannot be depended upon in making a diagnosis. and if treatment were uniformly governed by this examination, mistakes of the grossest nature would often be made. For example, the procedure advocated by the late Dr. Pryor of opening the vaginal vault and packing the pelvic cavity with iodoform gauze in febrile cases in which streptococci were found in the uterus would often result in infecting an uninfected peritoneum, and in the comparatively few cases in which such an operation is really indicated, there might be no indication for it in the bacterial contents of the uterine cavity.

Another question in this connection which must suggest itself is whether the presence of streptococci in the blood, indicating a general infection, contraindicates local surgical treatment and necessarily means a fatal issue if each flask of inoculated bouillon gives a very positive result in a luxuriant growth of streptococci. The answer to this question is best furnished by clinical experience. In one of the worst cases of general infection the patient was saved by operative treatment (abdominal section and vaginal section with drainage). Of the 12 cases in which positive results were obtained three died of sepsis, one of an intercurrent pneumonia. The

presence of streptococci in the blood, therefore, should not deter the operator from any surgical procedure which is obviously indicated and does not necessarily make the prognosis grave, though naturally the outlook is better if the infection remains localized than if it is general.

The next question to be discussed is the routine instrumental exploration and evacuation of the uterus in the treatment of sepsis after labor. I use these terms advisedly instead of that much misapplied expression curetment of the puerperal uterus. A long experience has taught me the necessity of this procedure in the majority of septic cases. There is usually a mass of hypertrophied and necrotic decidua in a septic uterus the removal of which benefits the patient. No one can tell the condition of the uterine cavity until it is explored. Consequently I feel that the following procedure is essential in the treatment of the majority, if not of all, patients: The vulva and vagina are cleansed; a bivalve speculum (Collins) is inserted and widely distended; the cervix is wiped off with pledgets of cotton and sublimate solution; an Emmet's curet forceps is gently inserted into the uterine cavity, cautiously opened and closed in all directions; if there is any doubt as to the removal of all the necrotic material, a broad dull curet is held between the thumb and forefinger and with the greatest gentleness is passed lightly over the uterine walls. If there is nothing in the uterus to be removed there is no result; if there is, it is discovered and removed at the same time, without traumatism, without pain and without anesthesia. This seems a much more sensible plan than to explore the puerperal uterus with the hand and then to evacuate it instrumentally if anything is discovered. The insertion of the whole hand in the uterus in the early puerperium will tear open wounds of the genital canal and is usually so painful to the patient as to demand an anesthetic. The gentle use of instruments is painless and is much quicker.

The reason that instrumental exploration and evacuation of the puerperal uterus has fallen into disrepute is that the average physician has carried it out like curetment of the nonpuerperal uterus, a procedure necessarily often followed by fatal general infection or by perforation of the uterus.

The use of antistreptococcic serum in the treatment of puerperal infection appealed strongly to every one, I think, who read the very convincing studies of Marmorek in the Pasteur Institute when they first appeared in the Annals of that institution. The history of this treatment is fresh in the minds of most of us, I dare say. The Marmorek serum was used extensively all over the world with disappointing results; I employed it over a period of two years in some twenty odd cases without perceptible benefit. The American Gynecological Society appointed a committee which reported adversely on it, so that the majority of specialists in America, I think, dropped it. Lately a serum has been prepared in this

country which can be secured fresh and which laboratory experiments at least have shown to be efficacious. Accordingly I resumed the use of it this autumn. I have employed it in eight severe cases, five of which were not benefited in the least, three of which seemed to be markedly benefited, and in two of the latter the serum seemed to be immediately curative. Consequently I shall use it in cases in which the blood cultures give positive results. Large doses (80 cc.) should be given and the administration should be begun as early in the course of the disease as possible.

The vexed question of the operative treatment of puerperal infection is a difficult one to deal with. There is no division of the subject on which there are more divergent views, at least in this country. I think an explanation of this fact is found in the anomalous relations to one another of the two branches of gynecology—obstetrics and diseases of women. The specialist in obstetrics has too often been deficient in surgical experience and ability; the specialist in diseases of women has had no experience with the varied phases of puerperal sepsis. Hence on the one hand operative treatment of puerperal infection is deprecated as unnecessary and unsuccessful, and on the other hand there is a disposition to advocate one specific operation as a cure-all. Pryor's operation is a good example of the latter tendency, so is hysterectomy early in the puerperium without some special indication for it, like suppurative metritis, necrosis of the myometrium or infection of a uterine fibroid. So also is the proposition to excise the thrombotic veins in puerperal phlebitis and to tie the ovarian vein in pyemia. As a matter of fact the most varied surgical procedures are demanded in a small minority of the cases of puerperal sepsis, for it is only in a minority of the cases that surgical intervention is indicated at all. In my own experience the following operations have been required: vaginal puncture for suppuration in the pelvic cavity; salpingo-oophorectomy and excision of the broad ligaments with drainage for streptococcic or other pathogenic infection of the pelvic connective tissue and of the appendages; hysterectomy partial or complete, from excision of the cornua to complete removal of the uterus for necrosis of the myometrium, suppurative metritis or infected fibroids; evacuation of intraabdominal abscesses by abdominal section varying from small isolated pus pockets between coils of intestines to general suppurative peritonitis; vaginal and inguinal incisions to evacuate abscesses in the pelvic connective tissue; suprapubic sections to evacuate an abscess in the connective tissue between the uterus and the bladder, not involving the peritoneal cavity; incisions into the pelvic joints to evacuate pus; a lumbar incision for perirenal abscess; incisions into the pelvis of the kidney for drainage; abdominal section for acute exacerbation of tuberculous peritonitis in the puerperium and for acute suppurative appendicitis; exploratory abdominal sections in cases of suppurative cellulitis to be sure that there is no involve-

ment of intraperitoneal structures and in intraperitoneal abscesses in which it appears that the abscess can be more safely opened and drained by vaginal puncture. As may be seen, there is no single operation for puerperal sepsis; there is no one operation that may be said to take precedence over all others in frequency and usefulness. The problems that have given me most concern in the operative treatment of puerperal infection are these: to determine when operative treatment, which ought to be avoided if possible, is really required, and to decide if vaginal, inguinal, lumbar, or suprapubic puncture will alone suffice without abdominal section. If it were possible to lay down dogmatic rules to govern our action all difficulty would disappear. The recollection of certain principles, however, is usually helpful. The course of every case of infection should be carefully observed for the appearance of certain conditions which can only be relieved by surgical treatment. The operator should satisfy himself by physical signs of the presence of intrapelvic or intraabdominal inflammation and supuration before resorting to operative treatment of any kind. A careful bimanual examination, repeated under anesthesia if necessary, should indicate often if intraperitoneal structures are free from involvement and if the infectious process is confined strictly to extraperitoneal tissues, but there is so often justifiable doubt on this point that a preliminary exploratory section is usually required to solve it. One point I think it is our duty to insist on most emphatically: that high temperature, rapid pulse, high leukocyte count, and the presence of pathogenic microorganisms in the uterus and in the blood are not of themselves indications for operative interference.

INTESTINAL HEMORRHAGE AS A FATAL COMPLICATION IN AMEBIC DYSENTERY, AND ITS ASSOCIATION WITH LIVER ABSCESS.

BY

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Death may occur in amebic dysentery from the gravity of the intestinal lesions; from exhaustion in protracted cases; from severe complications, particularly such as peritonitis due to the perforation of an ulcer in the large intestine or appendix, or an abscess of the liver or lung; from a terminal infection entering sometimes through the ulcerations in the large bowel; from intercurrent disease, and from severe intestinal hemorrhage. The last is of unusual occurrence and is a particularly rare fatal complication.

While the presence of more or less blood in the stools in this variety of dysentery is, in fact, a common symptom of the disease, and while at times the discharges consist almost entirely of blood and mucus, it is obviously not to these conditions that I wish to refer in this paper; instead, it is to the copious intestinal hemorrhage, in which several hundred cubic centimeters of

fresh blood are passed—such as one sometimes sees, for example, in typhoid fever and from which patients may succumb—that I wish here to invite attention.

Upon reviewing the literature, I find that but little notice has been attracted to this complication. Of the recent textbook articles on the subject, Scheube,¹ in his description of gangrenous dysentery, states that occasionally large quantities of pure blood are passed, and even death may result from bleeding. Manson² calls attention to the fact that whenever in gangrenous dysentery sloughs separate, hemorrhage is always possible, and that sudden collapse may occur from this cause even in otherwise mild cases. Sodre³ mentions that in some cases of acute and chronic dysentery an abundant hemorrhage of the intestine may be observed. When it supervenes in an individual already weakened by former losses, or by many days of disease, death may result from it, the patient dying in collapse. None of these authors, however, refers particularly to hemorrhages in amebic dysentery. Kruse and Pasquale,⁴ in their extensive monograph, do not mention severe hemorrhage in amebic enteritis, and Harris,⁵ in a summary of his own 35 cases of the amebic variety and of 78 cases collected by him in the United States, also does not refer to this complication. Osler,⁶ however, calls attention to it in acute amebic dysentery, and states that of the cases admitted to his wards during the past 12 years, there were 7 in which hemorrhage occurred from the bowels. The only direct reference I have been able to find in the literature of amebic dysentery in which the patient appeared to succumb from the loss of blood is one reported by Löffler.⁷ In this case only 125 cc. of clotted blood was passed from the rectum. The author states that here a diphtheric inflammation of the intestine was added to the amebic infection. It was the only instance of this nature observed by Löffler.

The following cases of amebic dysentery are the only ones that have come under my notice in which the patients have succumbed to the hemorrhage. They, therefore, seem worthy of report:

CASE I.—*Amebic dysentery; liver abscess; severe multiple intestinal hemorrhages; death; autopsy.*

The patient, a well-to-do merchant, aged 36, had resided in Manila for the past two years. On February 4, 1902, he consulted me, complaining of dysentery of several weeks' duration. An examination of the stools showed the disease to be of the amebic variety, the feces containing considerable blood and mucus and many actively motile amebas, some enclosing red blood cells. He was advised to enter the hospital for treatment, which he did. On admission, the subcutaneous fat was everywhere very abundant. The tongue was lightly coated and the conjunctivas of good color. The examination of the heart and lungs revealed nothing abnormal. The spleen was not palpable and the liver not enlarged. The abdomen was not distended and there was no pain on pressure. The temperature registered 99° and the pulse 72. Examination of the urine showed nothing pathologic. The patient was placed upon liquid diet and given Rochelle salt a half ounce. Local treatment consisting of high enemas of quinin solution 1-5000, was then begun and administered daily, the strength of the solution being gradually increased to 1-500, and the amount of fluid employed from one to two liters. Under such treatment and with occasional saline purges, he gradually improved. The tenesmus and irritability

of the large bowel gradually decreased and the blood and mucus almost entirely disappeared from the feces, so that after three weeks' treatment the bowel movements became reduced to one or two per day, and the patient was up and about though still under treatment. The case seemed to be progressing favorably.

However, on February 25, the temperature, which had not been above 99.5°, rose to 103° and the patient complained of headache and some pain in the chest. There was one bowel movement on this date. On February 26, the temperature remained in the neighborhood of 102°, but the patient complained of no pain. The bowels did not move for 24 hours. On the morning of February 27, a blood-examination of a fresh smear revealed some increase of the white blood cells and a blood count showed 25,000 leukocytes. He was given a half ounce of Rochelle salt, and an examination of the fluid stool passed shortly after revealed no blood. On microscopic examination a fair number of amebas and some epithelial cells and leukocytes were present. On February 28, the morning temperature registered 102°. The conjunctivas were slightly tinged with yellow. There was still complaint of some pain in the right side of the chest, but most of the pain was referred to the right inguinal region. The edge of the liver was not palpable. A blood count showed 28,000 leukocytes. A diagnosis of liver abscess was made and the patient was transferred to the surgical side of the hospital. The bowels moved but once on this date. On March 1, the temperature ranged between 102° and 103°, and on March 2 it touched 104.2°.

On March 3 he was operated upon. An incision was first made over the right hypochondriac region just below the costal margin and the lower portion of the right lobe of the liver exposed. An attempt was then made to locate the abscess through aspiration of the various portions of the liver with a long needle. This, however, failed and the liver was stitched to the abdominal wall and the patient returned to the ward.

On March 2 and 3 there were no bowel movements, but on March 4 the bowels moved four times during the day. The stools were thin and yellow but only the first contained a little blood. On March 5 there were three bowel movements at night. These were yellow, formed, and contained no blood. It should be mentioned that the local treatment with enemas had been discontinued since February 26. The fever still continued. On March 6 there were six bowel movements of greenish yellow color, containing some milk curds and other undigested food.

The patient was seen again by me on March 7. He then complained of pain in the region of the operation wound. While asleep there was considerable muttering and marked twitching of the hands. The temperature was 103.4°, the pulse 110. There was very slight jaundice of the conjunctivas. The abdomen was slightly distended. A blood count showed 18,000 leukocytes, there were three bowel movements on this date, one containing a little blood and mucus. A microscopic examination showed many amebas, some enclosing red blood cells. A diagnosis of typhoid fever was suggested by one of the staff in consultation and was particularly urged as the abscess had not been located, but arguing against such a diagnosis were the facts that the spleen was not palpable and there were no rose spots. Moreover the serum failed in the afternoon of this day to give an agglutinative reaction with *Bacillus typhosus*. It was suggested that the local treatment with quinin enemas be resumed and that another attempt be made to locate the abscess. Accordingly aspiration was again performed by the surgical staff through the abdominal wound, but still unsuccessfully. On March 8 there were two bowel movements after the enema of quinin solution, and on March 9, four. The movements were dark and thin, but macroscopically contained no blood. The temperature ranged between 102° and 103.6°.

On March 10, at 2.45 a.m., a large hemorrhage of about 500 cc. of fresh looking blood and containing four or five large clots was passed from the rectum. The pulse shortly after counted 140. The temperature was unfortunately not taken until two hours later when it registered 102.6°. The pulse then counted 134. The patient complained of great thirst, but apparently suffered no pain. On the morning of March 10, he was again seen. The subcutis of the hands was marked and there was some muttering delirium. The pulse was 120, of high tension but not dicrotic. His condition at this time suggested typhoid fever, a diagnosis in fact adhered to by one of the hospital staff; yet upon a careful analysis of his symptoms, the diagnosis of typhoid hardly seemed justifiable, and the serum again gave no Widal reaction. At 11.30 a.m. of this day, a second intestinal hemorrhage occurred, about 300 cc. of dark blood being passed. On the following day the intestinal symptoms seemed a little improved, but the leukocytosis and fever continued. On March 12, at 3.30 p.m., 500 cc. of fresh blood was passed from the rectum. The temperature dropped to 101° and the pulse became very weak and counted 140. An hour later another hemorrhage of about 200 cc. occurred. At 6.30 p.m., a large amount of clotted blood was passed. The patient complained of great exhaustion and weakness. At 8 p.m. another large hemorrhage occurred and at midnight and again at 12.30 a.m. smaller hemorrhages were passed. The pulse gradually weakened and increased in rapidity. Finally it no longer could be counted. The patient became very delirious and died during the night. Shortly before death there was a dark brown watery stool.

At autopsy a large abscess measuring 12 cm. in diameter was found in the right lobe of the liver situated superiorly and near the posterior surface. The liver was not enlarged. The gallbladder and ducts were normal. The spleen also showed no pathologic change. The walls of the large intestine were not particularly thickened and there was no excessive edema of the submucous coat. In the ascending, transverse, and upper portion of the descending colon there were about 50 or 60 ulcers scattered here and there, generally with even margins and with clean bases. Their edges were very slightly undermined. They measured from about 3 mm. to 12 mm. in diameter and about 1.5 mm. to 2 mm. in depth. Approximately 5 cm. below the cecum was an ulcer filled with a lightly adherent clot. On removal of the clot a freshly thrombosed vessel could be detected. At the edge of the ulcer the vessel was injected and could be traced with the naked eye for about 1 cc. in the submucosa. There was no diphtheria in the large bowel. The mucous membrane between the ulcers was pale in color. The ulcers were clean and nothing in their appearance suggested a fatal issue for the disease other than the one containing the blood clot. The ileum appeared normal. There were no evidences of typhoid fever.

The second case to which I wish to refer was seen in consultation with Dr. Otto Bartels, of Manila.

CASE II.—*Amebic dysentery; liver abscess; multiple severe intestinal hemorrhages; death; autopsy.*

The patient gave a history of having had several attacks of diarrhea during the past year, but had not noticed any blood in his stools. Since his entrance to the hospital a week before he had been complaining particularly of headache and restlessness. At times he had slight delirium. There was some constipation during this period and purgatives and enemas were prescribed for him upon several occasions. Amebas were present in his stools. His temperature for four days previous to the time I first saw him, April 6, had varied between 99.4° to 102.6°. There was no distinct jaundice. Owing to the pain in the right hypochondriac region, to the fever and leukocytosis of 23,000, a diag-

nosis of liver abscess was made and an operation advised. The patient, however, would not consent to an operation.

On April 8 there was a bowel movement, but none on the following day. On April 10, 11, and 12 the bowels moved once each day. The stools contained some mucus, and on microscopic examination, in addition to a few red blood cells, a number of motile amebas was observed. On April 11 hiccupping appeared and persisted for several hours. At 5 p.m., April 13, a hemorrhage occurred from the bowel of about 200 cc. of fresh blood. The pulse remained good, but the temperature fell from 101.5° to 98° two hours later. Early on the following morning the patient complained of pain in the abdomen and shortly afterward a large amount of fresh and partially clotted blood was expelled from the intestine. Two hours later there occurred another hemorrhage of about 400 cc. of bright red blood. The pulse became considerably weaker after the second hemorrhage and the temperature fell nearly 4° in three hours. The patient suffered from nausea and vomiting at intervals through the day and gradually became weaker. On the following day the pulse became very feeble. The vomiting continued until within a few hours of his death, which occurred on the following morning. There were no more hemorrhages or bowel movements.

At autopsy, there was a large abscess measuring about 14 cm. in diameter, situated in the right lobe of the liver. The left lobe contained a small abscess measuring about 7 cm. in diameter. The liver tissue was very fatty. The gallbladder and ducts were normal. The large intestine contained many shallow ulcerations, some of which were in the healing stage. The large bowel contained some dark clotted blood. After a careful search I was unable to locate any specific point from which the hemorrhage had occurred. Scrapings from the intestinal ulcers and from the walls of the abscess showed many motile amebas, some containing red blood cells.

The question suggests itself why severe intestinal hemorrhage is not of more frequent occurrence in amebic dysentery, particularly when one considers the extensive lesions of the submucosa which are present in most of the advanced cases. However, the additional points in the pathology of the infection which would tend to prevent hemorrhage must be recalled, viz., the thrombosed condition of the bloodvessels in the zone of infiltration and edema which surrounds the ulcers, the infiltration of the walls of the arteries, and the more or less marked evidence of endarteritis, as the progress is rapid or slow. In chronic cases one may see at times the lumina of the arteries entirely occluded by this process.

On the other hand, the frequent occurrence of smaller amounts of blood in the stools may be explained from the fact that the walls of the veins are early infiltrated with round cells, followed by softening and complete disorganization; also from the fact that amebas may penetrate the walls of a vein; however, thrombosis of the veins is not frequent.

As a rule the blood in the stools in amebic dysentery probably arises not from one but from many ulcers about which the capillaries are usually considerably distended and frequently form a network at the bases and margins of healing ulcers. If at autopsy one removes the upper layer of the mucosa in the vicinity of an ulcer one frequently finds small hemorrhages in the upper portion of the submucosa. When the overlying mucosa becomes necrosed and sloughs, the blood from these vessels finds

its way into the lumen of the intestine and appears later in the stools. However, in the preceding cases, the hemorrhage probably arose from a single ulcer involving a bloodvessel.

Since the foregoing observations were recorded to the Manila Medical Society in 1902, F. Haasler,⁸ in the same year, in an article treating of the complications of amebic dysentery and reviewing 600 cases of the disease occurring in China, mentions three of severe intestinal bleeding, in two of which the hemorrhage was considered the cause of death. In one of the cases about four liters of blood was passed and the author was able to find at necropsy a thrombosed vessel from which the bleeding occurred. A most interesting fact in connection with these cases and one emphasized by this author is that in both of the fatal instances in which death was due to the hemorrhage, liver abscess coexisted.

Woodward,⁹ in 1879, also reported two cases of dysentery in which profuse hemorrhage occurred and in which large liver abscesses also existed. In the first instance death resulted immediately from the hemorrhage. Though the cases were not diagnosed as those of amebic dysentery, there can be little doubt from the histories and autopsies that they were indeed instances of this variety of the disease.

During the past two years I have encountered two more fatal cases of amebic dysentery with severe multiple hemorrhages, in both of which large liver abscess was present. In the last one, the time of coagulation of the blood was not complete until nine minutes. There was no marked jaundice present.

These cases may here be briefly recorded :

CASE III.—Chronic amebic dysentery; multiple liver abscess; severe intestinal hemorrhages; death; autopsy.

The patient, aged 27, was first seen in October, 1903. At this time his general physical condition was fair, but he was already suffering with a well-advanced case of amebic dysentery of about two months' duration. The stools were numerous and contained large amounts of bloodstained mucus. He was placed upon local treatment of high quinin enemas and pursued this treatment daily for nearly four months. During this time his general condition gradually improved. On several occasions for one or two weeks at a time, the stools became fairly normal, one or two per day, and contained no amebas and no mucus or blood; but notwithstanding the fact that the local treatment was continued, the disease always broke out afresh and amebas and mucus and blood reappeared in the stools. In January, however, he felt sufficiently improved to leave Manila for Japan, where he remained for about three months. During some of this time he neglected treatment entirely. For the first month he reported he was pretty well, but shortly afterward an acute exacerbation of the dysenteric symptoms appeared and he was compelled to enter a hospital. As soon as his condition temporarily improved he returned to Manila. He was seen again by me on April 9; at this time he was considerably emaciated and his face was drawn. He complained of an aching sensation in the right shoulder. The liver was distinctly palpable for several fingers' breadth below the costal margin. The temperature registered 100° and there was a leukocytosis of 15,000. His pulse counted 112. The question of operation for liver abscess was considered, but was not immediately urged. Owing to the chronicity of the dysentery and the general condition of the patient, it was decided that an attempt be first made to ameliorate the

dysenteric symptoms. He was therefore placed again upon quinin enemas, with occasional doses of Dover's powder, and was given in addition stimulants, with the hope that in a few days his condition might so improve as to warrant an operation. His diet consisted only of liquids. The temperature ranged for the next two days between 100.2° and 103.2°. The bowel movements numbered three or four per day and usually contained considerable mucus. On April 12, at 9 a.m., his daily quinin enema was administered. During the day there were two bowel movements, the last at 8 p.m. At 7 p.m. a large intestinal hemorrhage occurred, nearly a pint of fresh blood being passed. At 9 a.m. a second hemorrhage, smaller in amount but of the same character, occurred. At 12.30 a.m. a large amount of dark blood was passed. Morphine was administered hypodermically, and later ergot. Finally, a hot enema of tannic acid was given, but no favorable results were apparently obtained. Between 12.30 and 8 o'clock the next morning there were five small hemorrhages. At the latter hour the temperature registered 99° and the pulse 138. The patient gradually sank. There were no more large hemorrhages from this time to his death, which occurred at 7 o'clock the following morning, but the movements which occurred and were passed into a bedpan consisted almost entirely of clotted blood.

At autopsy the large intestine showed extensive ulcerations throughout. The ulcers were, as a rule, shallow, usually undermined, and with smooth or slightly uneven reddened margins. In the cecum deeper ulcerations were present and between these lesions portions of the mucosa were covered with pseudomembrane. Some of the ulcers in the cecum were gangrenous. The contents of the large bowel consisted of dark reddish masses of fluid and partially clotted blood, together with some mucus.

The lower end of the ileum for about 15 cm. above the valve also showed ulceration. No distinct point from which the hemorrhages arose could be detected anywhere in the entire intestine.

There were six abscesses of the liver situated in both the right and left lobes and measuring from 5 cm. to 10 cm. in diameter. A number of the hepatic veins contained thrombi.

CASE IV.—Amebic dysentery; liver abscess; severe intestinal hemorrhage; death; autopsy.

The patient, a Spanish sailor, was first seen after an alcoholic debauch. At this time he was dull and stupid. He complained of acute dysentery. A companion stated that he had been bleeding extensively from the rectum during the previous day. At the time of my visit his temperature registered 99° and the pulse counted 114. No distinct history of previous dysentery could be obtained. The patient refused to enter a hospital. A portion of a bowel movement, consisting of reddish-brown masses of blood and mucus, was secured, and a microscopic examination showed numerous amebas and red blood cells and considerable altered blood pigment. Later in the day a blood count showed 9,000 leukocytes per cubic millimeter. The coagulability of the blood was tested and found to be complete only after nine minutes. The liver dulness was distinctly increased upward in the right axillary line above the fifth rib. The patient complained of slight pains below the right axillary region. The conjunctivas were slightly jaundiced. Morphine, calcium chlorid, and absolute rest were prescribed. The patient was seen again on the evening of the same day. At this time his pulse counted in the neighborhood of 150, and was weak and thready. The extremities were cold. He was already unconscious. His companion stated that he had passed three or four large hemorrhages from the bowels during the day. The sheet upon which he was lying partially disclosed this fact, being in places soaked with fresh blood. He gradually sank and died during the night. A complete autopsy could not be performed, but an incision was made over the right

hypochondriac region, the liver drawn down, and the diagnosis of abscess in the right lobe confirmed.

On recalling the infrequency of fatal hemorrhage in amebic dysentery, it seemed to me that some reason other than the anatomic situation of the ulcer might exist in the preceding cases, and which might account for the persistence of the bleeding and for their unfavorable outcome. Since in all of these cases large liver abscess coexisted, the connection between intestinal hemorrhage and the hepatic condition has suggested itself very strongly to me. The idea that the destruction of such large amounts of liver tissue may sometimes bring about serious functional disturbances of this organ and lead to a condition which predisposes to hemorrhage must certainly be considered. James Finlayson,¹⁰ as long ago as 1873, in discussing a case of liver abscess in which intestinal hemorrhage had occurred, argued that hepatic abscess by interfering mechanically with the portal circulation may produce congestion of the mucous membrane of the colon and thus favor the development of hemorrhage. The relation between hemorrhage and various other diseases of the liver, such as acute atrophy, syphilis, cancer, and affections of the biliary passages, particularly when jaundice is present, is well known. However, it is true that in typhoid fever severe and fatal intestinal hemorrhage may occur independently of any extensive lesion of the liver, though it has even been claimed that when such a result takes place it depends chiefly upon a diminished coagulability of the blood,¹¹ or to special bacterial activity.¹² Therefore, while it obviously is probable that more extensive observations will show that fatal intestinal hemorrhage in amebic dysentery may occur entirely independently of liver abscess, the cases to which I have referred would seem to point out that at least when hemorrhage occurs in cases complicated with such hepatic disease it is likely to be very severe and that the bleeding is likely to recur.

It is possible also that the occurrence of multiple intestinal hemorrhages in amebic dysentery may be occasionally of some importance in the diagnosis of liver abscess. In my last case there was no fever and no leukocytosis, and, although the liver was slightly enlarged and abscess was suspected, I did not feel by any means certain of such a diagnosis. However, when the intestinal hemorrhages appeared, reasoning from my knowledge of the conditions in the other cases, I felt confident of the existence of hepatic abscess, a diagnosis, which, as already mentioned, was confirmed at autopsy.

In this connection I was recently much interested to find in Woodward's article on dysentery in the "Medical History of the War of the Rebellion, 1879," the statement that "hemorrhage from the bowels is another occasional symptom of liver abscess and sometimes is the immediate cause of death." This statement seems to have received no attention in the literature of amebic dysentery.

We are about to undertake a study of the coagulability of the blood in our cases of amebic dysentery (employing Wright's method and that of Brodie and Russell, as used by Pratt) for the purpose of ascertaining if any changes occur either during the course of the uncomplicated disease

or in those cases in which liver abscess or hemorrhage develops.

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TROPICAL LIVER ABSCESS: REPORT OF THREE CASES, WITH SPECIAL REFERENCE TO THE BLOOD FINDINGS.

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During the period beginning January 1, 1902, and ending August 31, 1905, 10,603 cases in all were treated in the wards of the United States Army Division Hospital, at Manila, P. I. Of this number, 1,523 were of the dysenteric type, classified as follows: amebic, 859 (diagnosis confirmed microscopically); catarrhal, 236; and dysentery, acute or chronic (type not noted), 428.

Members of the military forces of the Philippine Division are treated in the hospital of the post at which they are serving, and the cases which respond to treatment are cured and the men returned to duty. The division hospital receives dysenterics whom it is thought necessary to transfer to the United States.

Therefore, of the 1,523 cases mentioned, the vast majority, particularly those of the amebic type, were more or less of an intractable character, and the patients were invalided home after an extremely short period of observation, varying from one to eight weeks. It is for this latter reason that the condition of amebic or tropic liver abscess, to which I wish to call attention, is so comparatively rarely recorded, there being only 34 cases noted during this 3½-year period. Of these I wish to report in detail three, occurring in my personal service, and with the remainder, none of which have been previously reported, endeavor to draw a few conclusions, particularly in regard to the leukocyte count found in this most interesting condition.

CASE I.—W. L. D., male, white, aged 28, admitted May 15, 1905. Civilian, Q. M. employe. Born in New York.

Family History.—Father died of gastroenteritis. Mother, one brother, and three sisters living and well.

Previous Personal History.—He has been in the Philippine Islands four years. He has never had pneumonia, pleurisy, typhoid, or malarial fever. He had dengue fever and rheumatism in 1902; dysentery in August, 1904, and was in the hospital two months. He had a severe pain in the right side and diarrhea at that time. The laboratory reports during that period show:

August 17, leukocytosis, faint trace of albumin in the urine, no casts; August 21, leukocytosis 21,800, malaria negative, stools contain ameba coli; August 22, leukocytosis 21,800; August 23, leukocytosis 23,400, negative malaria and Widal; August 25, leukocytosis 26,800,

later 35,200; August 26, leukocytosis 36,700, *i. e.*, polymorphonuclear neutrophils 70.3%, eosinophiles* 2.3%, transit 10%, small mononuclears 7%, large mononuclears 10%, malaria negative; August 27, leukocytosis 38,500; August 29, leukocytosis 49,500; August 30, leukocytosis 30,800, later 22,400; September 4, leukocytosis 15,600; September 11, leukocytosis 8,800; September 23, leukocytosis 16,200.

The patient was discharged October 10, 1904, with a diagnosis of chronic amebic dysentery. No positive diagnosis of liver abscess was made at that time.

Present Attack.—The patient has practically never been well since leaving the hospital. Cramps and abdominal distress occur after eating. Pain in the right hypochondrium began a month ago, gradually becoming worse, on occasions referred to the right shoulder. He has never had jaundice. There has been no nausea or vomiting and no diarrhea since leaving the hospital in October.

On Admission.—Pain and tenderness are present in the right hypochondrium. No nausea or vomiting. Appetite is fair. Bowels are constipated. There is no cough, no vertigo, no dyspnea, no headache. Loss of weight 15 pounds. He is quite weak. The lungs are clear throughout.

Heart.—Third interspace, left parasternal line. Apex beat in fifth interspace in the midclavicular line. The sounds are clear and of good quality.

Liver.—Midaxillary line, sixth interspace; midclavicular line, fifth rib; posteriorly, tenth interspace.

The lower edge is not palpable on account of tenderness, but appears to extend 1 cm. below the costal border. Percussion over the entire area of hepatic dullness gives rise to acute pain. There is no jaundice.

Spleen.—Not enlarged.

May 16, leukocytes 13,600, feces negative for ameba, urine negative, fever irregular, varying from 100° to 104°; May 17, condition of the liver unchanged, no jaundice; May 18, blood count, red blood cells 4,320,000, leukocytes 16,600, hemoglobin 85%; May 19, tenderness disappearing over the sixth and seventh ribs, but persistent below; patient transferred to surgical ward with diagnosis of abscess liver, amebic.

May 25, the patient was operated upon by Lieutenant W. H. Moncrief. An incision was made 1 cm. below and parallel to the costal border, in the right upper abdominal quadrant. On exposure and palpation of the liver there was no evidence of fluctuation. Pus was located by aspiration. Incision revealed an abscess cavity the size of a walnut in the right lobe, 5 cm. from the surface. Drainage was instituted.

May 26, slight discharge with little odor; May 28, improving, all packing removed; June 7, improvement continued until two days ago, when the patient's appetite became capricious and he complained of general malaise, with elevation of temperature. Some pain about the wound, very severe last night. Examination of dressings showed profuse purulent discharge. He was anesthetized, and a large abscess cavity demonstrated above and to the right of the smaller one first found; 250 cc. to 300 cc. of pus was evacuated; June 9, discharge is decreasing; June 20, pus from abscess cavities negative for ameba; July 10, healing complete, patient discharged as cured; August 11, blood count, four months after operation, red blood cells 4,670,000, leukocytes 5,200, hemoglobin 92%.

CASE II.—F. H. S., male, white, aged 27; private Troop B, Second Cavalry; admitted September 9, 1905.

Family History.—Unimportant.

Previous Personal History.—Measles and mumps in

childhood. He has never had pneumonia, typhoid, or rheumatism. No gastric or intestinal symptoms previous to his arrival in the Philippine Islands a year and ten months ago. June, 1904, he was sick in the hospital for ten days with fever, for which quinin was taken. He was cured.

December, 1904, he had dysentery, with blood and mucus in the stools; this continued for three weeks and was apparently cured. It has never recurred since, in fact, he states that a condition of chronic constipation has supervened. In May, 1905, patient states that he vomited a round worm.

History Previous to Admission.—While shoveling sand on fatigue at post, June 10, 1905, patient states that he slipped and was seized with an acute pain in the lower right chest. That night he noticed that he could not lie on his left side on account of the pain; also noticed the presence of some dyspnea. The day following he was admitted to the post hospital. About five days later he noticed a peculiar "trickling" sensation in the right side. Fairly well from then until the beginning of September, when he had fever and sweats. Two distinct chills.

Condition on Admission.—Some soreness in the epigastrium, with slight pain in the right shoulder. No cough; no dyspnea; no expectoration; no pain in chest; no vertigo; no headache; no appetite; bowels regular. He complains of being very weak and sleeping poorly, but aside from this says that he feels well. Physical examination shows flatness over the lower lobe of the right lung as high as the sixth rib in front and the eighth rib posteriorly; absence of breath sounds over this area; absence of resonance and fremitus. No change in dull area in changing position. Bronchial breathing over the remainder of the right lung. The left side of the chest is negative. The heart is not enlarged and the sounds are clear and of good quality. The liver dullness merges with that mentioned and extends downward to the costal border. The spleen is not enlarged. Remainder of the abdomen is negative for tenderness and masses. No jaundice. Fever irregular, 99° to 102°.

He was transferred to the surgical ward September 12, 1905, with diagnosis empyema, right pleural cavity, cause probably pleurisy with effusion.

September 13, right side of chest aspirated and 400 cc. of reddish-brown purulent fluid drawn off. Microscopic examination determines nothing definite as to the character of the fluid.

September 15, operation was performed by Lieutenant W. H. Moncrief. Thoracotomy; evacuation of approximately 1,000 cc. of pus after excision of 6 cm. of the eighth rib. Pus very thick and creamy, largely tinged with red. Very unlike usual fluid seen in cases of empyema. The walls of the chest cavity over the lower two-thirds are covered with thick grumous material; this was loosened up and evacuated. Careful exploration failed to demonstrate conclusively to touch any opening in the diaphragm; but the incision was not enlarged nor special efforts other than digital examination used to determine this. A large rubber drainage-tube inserted.

October 31, uneventful convalescence. Tube gradually shortened and wound healing, until this day the process is complete.

Laboratory Reports.—September 9, blood for malaria negative. September 10, blood for Malta fever negative; reaction 1 to 100, two hours; urine contains a faint trace of albumin. September 12, blood for Malta fever negative; reaction 1 to 40, one hour; malaria negative; leukocytes, 12,800. September 16, urine contains a faint trace of albumin. September 17, urine negative; stools negative for ameba. September 19, stools negative for ameba. September 20, pus, thoracic cavity contains pus and red blood cells and actively motile ameba.

November 14 he started for the United States, cured.

*In an interesting paper read before the Pathological Society of Philadelphia, December 25, 1905, H. M. Snyder called attention to the work being done upon eosinophilia in amebic dysentery and reported a case. Further investigation in regard to eosinophilia in amebic liver abscess should prove interesting.

CASE III.—W. A., male, aged 30; civilian employe, Q. M. D.; American negro; admitted June 28, 1905; diagnosis undetermined.

Family History.—Unimportant.

Previous Personal History.—He has been in the Philippine Islands six years. Previous to his arrival he had always been healthy and well. He had malarial fever in 1900. He has had four attacks of dysentery with blood and mucus in the stools; the last attack occurring in 1902. On April 29, 1905, without any known exciting cause, the patient states that he began to have pain and tenderness, or rather "soreness," in the right hypochondrium, with fever, but no vomiting and no diarrhea. He was operated upon May 3, in a civil hospital, for "an abscess in the side."

Present Condition.—Complains principally of a dull ache in the right hypochondrium just below the margin of the ribs; not referred. Feels feverish, with occasional sensations of chilliness, but no distinct rigors. No cough, no pain in thorax, no dyspnea, but he states that deep inspiration causes a stitch in the side. Belching and flatulence are present, but no nausea and no vomiting. Bowels are constipated.

The patient looks apathetic. He lies on his right side with his right thigh flexed. The mucous membranes have a very slight yellowish tinge. The tongue is fissured, dry, and furred. The lungs are clear throughout; no rales, no dullness, and no friction sounds at the right base.

Heart.—Lower border of the third rib; left parasternal line to apex beat, which is visible and palpable in the fifth interspace, midclavicular line. The heart sounds are clear and of good quality.

Abdomen shows a scar in the right upper quadrant 5 cm. long and 1 cm. below the costal border.

The liver dullness is defined as follows: The upper border corresponds to the fifth rib in the midclavicular line and to the sixth in the midaxillary; from here it extends downward to 3 cm. below the costal border. The edge feels firm to the touch and is extremely tender to palpation. The spleen extends from the ninth to the eleventh rib and is not palpable. His weight is 135 pounds.

The urine contains a trace of albumin, but no casts, specific gravity 1,015. The stools are negative for ameba, but contain trichomonas. The leukocyte count is 12,000. He was transferred to the surgical ward July 3, 1905, with a diagnosis of abscess liver, amebic.

July 5, complains of severe pain in the right side, but no change in the physical signs, fever of varying intensity, 99° to 102.6°; July 6-10, is fairly comfortable, but condition is not improving, the leukocytosis persisting and the local condition of the liver remaining unchanged. It is decided to operate. July 11, operation performed by Lieutenant R. F. Metcalfe; a subcostal incision was made and an abscess cavity of 4 cm. in diameter found by aspiration near the surface of the right lobe; it was incised and drained; August 18, despite operation, the patient continues to lose flesh and strength, his appearance is septic, albuminuria continues; determined in consultation that a second collection of pus exists and reoperation decided upon; August 19, operation, 3.5 cm. of the eighth rib was excised in the midaxillary line, the liver was reached and a cavity approximately 2.5 cm. in diameter incised and drained.

Following this operation the pain continued, the area of hepatic dullness remained unchanged, there was progressive loss of flesh and strength, and jaundice. Diarrhea set in; the stools contained mucus and were extremely fetid. The patient became septicemic and died September 9, 1905.

During the time in which he was an inmate of the hospital there was no evidence of cardiac or pulmonary involvement or of a general inflammatory process in the peritoneum.

LABORATORY REPORT.

Blood: Leukocytes, June 29, 12,000; July 1, 11,600; July 6, 11,800; July 17, 12,400; August 3, 9,000; August 13, 12,000.

Urine: June 27, specific gravity 1,015, trace of albumin, no casts; July 11, specific gravity 1,007, trace of albumin, no casts; July 12, specific gravity 1,022, faint trace of albumin, no casts; August 13, specific gravity 1,007, faint trace of albumin, no casts; August 20, specific gravity 1,018, no albumin, no casts.

Pus from wound: July 11, negative for ameba.

Feces: Despite repeated examination, amebas were not found in the stools until September 2, from which time on they were present with pus cells and a few erythrocytes.

Autopsy.—Six hours after death. Body is that of a somewhat emaciated colored man of middle age. Rigor mortis is present in muscles of lower extremities and neck, but absent in upper extremities. Pupils equal and moderately dilated. No general glandular enlargement.

Thorax: Pleural cavities free of adhesions and exudate. Lungs moderately inflated, pale salmon-pink on section; no nodules.

Heart of normal size, pericardium contains 50 cc. of straw-colored fluid, endocardium free of vegetations, yellow-white clots in both sides of the heart.

Abdomen: In parasternal line there is an old scar just below the costal border 5 cm. long. In the mid-axillary line there is a wound 7.5 cm. long through the skin and leading down to the liver, covered with a thick plastic exudate. Both of these are just beneath the costal border. Over the eighth rib in the anterior axillary line there is a wound 10 cm. long, through which a rubber tube protrudes; 4 cm. of the eighth rib have been resected. On slight pressure a yellowish-brown semi-fluid exudate appears in the wound.

On opening the abdomen the liver is found to be adherent to the diaphragm, and the pleura through which the operating wound was made has so adhered as to shut off the pleural cavity, so that the drainage-tube before mentioned appears to lead directly into the liver and is without connection with either the pleural or abdominal cavities.

At this point in the liver corresponding to the parasternal line there is a small, short sinus surrounded by scar tissue.

On the under surface of the right lobe there are many adhesions binding the right kidney and adrenal, together with the hepatic flexure of the colon, to the under surface of the liver. The kidney and adrenal are with difficulty dissected free and are found to be uninvolved. The colon, however, contains a 1 cm. opening into an abscess cavity in the liver. This cavity is approximately 12 cm. by 10 cm. by 10 cm. and is lined with firm tissue, which internally is black, and of a slightly glistening white color where it is connected with the surrounding liver tissue. The cavity is partially filled with yellowish-brown semifluid pus. Lying above this abscess is another, which is just at the dome of the liver; it is smaller in size and filled with a yellowish-white thick material. Its wall is white, thick, and fibrous, and forms part of the wall of the abscess beneath. The kidneys, adrenals, bladder, and pancreas present no noteworthy features. The spleen is adherent to the diaphragm, is of a light red color, soft, not enlarged, trabeculae distinct. The stomach and small intestines are apparently normal. Beginning with the caput coli, and extending to the rectum, the large intestines are found to be the seat of ulcerations. These vary in size from a pinhead to a centimeter, are scattered through the width of the gut, and are at times undermined with swollen borders. These ulcers rarely extend to the muscular coats, except at the hepatic flexure, near which they appear deeper. The mucous membrane remaining is injected and in certain areas superficially necrotic.

Microscopic examination of the discharge from the wound, the contents of the abscesses, the walls of the intestinal ulcers, and the feces, all show living amebas.

Anatomic Diagnosis.—Amebic dysentery and abscess of the liver, chronic, adhesive, and localized pleuritis and peritonitis.

Manson,¹ with his wide experience in tropic diseases, has most truly written that "golden rules in tropic practice are to think of hepatic abscess in all cases of progressive deterioration of health, and to suspect liver abscess in all obscure abdominal cases associated with evening rise of temperature."

In the light of the preceding, I feel that a repetition of what are probably wellknown facts in regard to hepatic abscess, with the little additional information which may be gleaned from the foregoing cases, will not be amiss.

History.—Hepatic abscess has been known since the time of Hippocrates, who described cases of the disease, together with the opening of the abscess cavity by cautery. It may be interesting to us to know that Osler² was the first American physician to report this condition, demonstrating ameba coli in the contents of the abscess.

Etiology.—In speaking of the ameba found in connection with liver abscess, the ameba coli described by Lösch is referred to. This name was given by him to a pathogenic ameba, and as Wooley and Musgrave³ state, "why this term should be applied to a supposititious nonpathogenic organism it is difficult to say."

Predisposing Causes.—Climate: It is practically certain that climate plays an important role, if only from the fact that a change of residence from a temperate to a tropic zone leads to hyperemia of the liver, rendering it more susceptible to the action of the exciting cause.

Season is not a factor. Rogers,⁴ in an analysis of 236 cases, concludes that the seasonal influence is *nil*. My cases are entirely too few in number to enable me to draw comparisons; with the exception of a slight diminution in the number occurring in the third quarter, there is no variation.

Race: The native race of a given country enjoy a comparative immunity, even though the percentage of dysentery may be much higher among them; this is well illustrated by the following table given by Manson¹ for the year 1894:

Dysentery, admission per 1,000 strength: Native army of India, 43.8; European army of India, 28.6.

Liver Abscess: Proportion deaths to total mortality: Native army of India, 0.6; European army of India, 7.4.

The immunity of the native races diminishes in proportion as they approach more nearly the standard of living set by the Europeans with whom they are in contact, and as they come under the influences of urban life.

Exposure by affecting changes in the blood supply of the liver becomes of etiologic significance.

Sex: The disease rarely affects the female; and this, independent of the fact that almost all the men who have worked on this hepatic condition have based their statistics upon practice among soldiers or government employes where necessarily the males predominate.

Age: The period from 20 to 40 appears to be that in which the vast majority of cases are noted. It is said by some authorities not to occur in childhood, but Arnott⁵ reports a case in a child of 2½ years, and Amberg⁶ has placed on record five cases. Old age, again, enjoys comparative immunity.

Alcohol and improper food, by diminishing the resistance of the liver, increase the frequency of abscess formation. Rogers⁴ finds a history of alcohol in over 50% of all cases.

Disease: Yellow fever, by bringing about degenerate changes in the liver, is said to leave in its train a field for the development of liver abscess.

Cirrhosis of the liver has no etiologic significance.

Malaria: One who has been, even for a short time, in the tropics, and has observed at autopsy the changes taking place in the liver, particularly in the estivo-autumnal type of this disease, must grant that it plays a part, not as a determining, but as a predisposing factor in hepatic abscess. When we consider, however, the few cases in which hyperplasia of the spleen is associated with liver abscess, the infrequency of even this must be granted. Malbot,⁷ however, concludes that malaria is the most effective predisposing cause, and that dysenteric factor is less active; the role of the latter being that of any other intestinal lesion, in carrying the seed to the ground already prepared by malaria.

Dysentery: The question as to whether this disease shall be considered a predisposing or exciting cause depends on the light in which we regard hepatic abscess; as *per se*, a complication of amebic dysentery, or as a separate and entirely distinct manifestation of the pathogenicity of the ameba coli; in other words, as *hepatic amebiasis*. I am inclined to the latter view. That a certain definite percentage of cases have neither a history of dysentery nor lesions at autopsy, but present ameba in the abscess contents, confirms this theory.

Rogers⁴ gives the following table from an analysis of 39 cases:

		Cases.			
Previous history, dysentery	and lesions at autopsy	No.	%	Previous history, dysentery	and lesions at autopsy
No	"	21	53.85	No	"
"	" but	7	17.95	"	" but
"	" and	6	15.38	"	" and
No	"	5	12.83	No	"
				Total	
				87.18	

A summary of my cases shows recoveries, with a previous history of dysentery, 15 cases; no previous history of dysentery noted, 3 cases; deaths, with a previous history of dysentery, lesions at autopsy, 7 cases; no previous history of dysentery, lesions at autopsy, 2 cases; no previous history of dysentery, no lesions at autopsy, 2 cases. No autopsy in 5 cases; 3 have had ameba in stools and history of dysentery.

Kelsh and Niemier,⁸ in an analysis of 500 observations, find that in 85% dysentery is found associated with liver abscess.

Malbot,⁷ in his 19 cases, found that only six patients had dysentery before or after, but grants that dysentery may be the pathogenic cause, though proof of it is lacking.

Kartulis⁹ believes that a small number may be ascribed to other causes, and apparently have no connection with amebic dysentery.

Rolleston¹⁰ cites a case in which the typhoid bacillus was the cause of a large single abscess.

Buchanan¹¹ quotes a large number of cases for his contention that dysentery is not at all an important factor in the occurrence of liver abscess. He points out the frequent occurrence of dysentery among the natives of India, and at the same time calls attention to the few cases of liver abscess. The decrease in liver abscess among the white soldiers was synchronous with increase in abstinence; so that beside dysentery, still another important factor must be present to account for liver abscess.

To me it appears that the rational theory is that the role which the active dysenteric process plays is that of rendering more facile the passage of the ameba coli from the colon to the liver, opening by its tissue destruction and ulcer formation three routes of hepatic infection, where but one, the common bile duct, exists in health.

Exciting Causes.—Ameba Coli: The scope of this article does not allow of a discussion of the biologic, cultural, and etiologic significance of this protozoon, aside from its relation to liver abscess, and the reader is referred to the special articles bearing on this subject. Nor will *Bacillus dysenteriae* be considered.

The ameba coli is the only organism constantly found associated with tropic liver abscess, the pyogenic bacteria being absent in the majority of cases when the abscess is first opened. Kruse and Pasqual¹² found all varieties of bacteria, but no specific element aside from ameba, and are firmly determined that amebas are the primary agents, but that they always occur in company with bacteria which are not specific but possess pathogenic properties.

Assuming the presence of ameba coli in the intestine, either normal or dysenteric, there are three routes through which it may gain access to the liver: (1) Through the portal vein; (2) by an outwandering from the gut across the peritoneum; (3) via the common bile duct. These will be taken up seriatim.

1. Through the Portal Vein: This method of hepatic infection is, in all probability, by far the most common. Woolley and Musgrave³ have in a recent article demonstrated ameba in the bloodvessels of the mucosa and in the dilated veins of the submucosa, thus rendering their transmission to the liver by way of the portal system a simple mechanical flow.

2. Across the Peritoneum by Ameboid Movement: Dopter,¹³ quoting Jürgens,¹⁴ states that the latter has observed amebas as deep as the peritoneal serous coat in cats, which were the subject of experimental dysentery, and in view of the ease with which the ameba penetrates tissue, it becomes clear that their outwandering from the gut and subsequent migration across the peritoneum to the liver are feasible. Rogers¹⁵ believes that this is the most common method of infection, in this way accounting for the preponderance of the single over the multiple type of abscess. Bassett-Smith's¹⁶ case of infection of the lung without perforation of the diaphragm well illustrates the power of the organism to infect without solution of the continuity of tissue.

3. Through the common bile duct, this constituting a direct route for the passage of protozoa, by their ameboid movement, to the liver. The failure of observers thus far to demonstrate ameba in the lymph-glands

precludes, for the present at least, the inclusion of a fourth route of infection, *i. e.*, through the lymphatics. The situation of the dysenteric ulcers in the intestine has some bearing on the frequency of infection of the liver, ulcers of the caput coli and ascending colon being more apt to be associated with disease of the liver than corresponding disease lower down in the gut. In fact, Kartulis⁸ advocates early extirpation of the appendix if its involvement, during the course of dysentery, is suspected, believing that this will do away with many of the so-called cases of idiopathic liver abscess.

Pathology and Morbid Anatomy.—Dopter,¹³ working on the pathology of dysentery, has demonstrated that when the ameba penetrates a tissue it determines both a local action and an inflammatory reaction at a distance. This is soon followed by necrosis, a constant and essential manifestation of its pathogenic action. The ameba having gained access to the liver and lodging in one of the portal radicles, a clot follows. The blood supply is shut off. A focal necrosis ensues, the amebas proliferate, and then ensue the changes mentioned. If the infection is by either of the other routes the pathologic process as described by Dopter ensues immediately.

Assuming that the amebas gain access to the liver by any of the three routes, abscess formation in the light of the preceding is easily explained. The growth in size of the cavity and its development are further stages in the process of proliferation of the protozoa and necrosis of the liver cells. That it is not true inflammatory process is shown by the fact that the characteristic inwandering of the leukocytes is absent.

The Abscess.—Statistics show no immune region of the liver. Approximately 70% of all abscesses are located in the right lobe, the remainder in the left. Less than 1% are found in the lobus speigellus. The most common site is the convexity of the right lobe, near the surface. Singleness is the rule and Cases I and III are exceptional in their multiple feature.

There is no evidence of acute inflammation about the abscess cavity; in the majority of cases the formation resembles more nearly the tuberculous "cold abscess" than a pyemic process, and the wall is composed of necrotic and broken-down liver tissue. In a few cases a slight inflammatory process supervenes and forms a wall of fibrous tissue.

The contents of the abscess may be "laudable" but more often consist of chocolate (Anchovy sauce) colored pus; this being composed of detritus from the broken-down liver cells, pus cells, ameba coli, motile or dead, and occasionally bacteria, though in the majority of instances the contents are sterile when the abscess is first opened. As to the presence or absence of the ameba, Rogers¹⁷ finds the living ameba during life or at autopsy in two-thirds of the cases which are otherwise sterile.

During life the amebas as a general rule do not inhabit the pus itself but are found on and in the walls of the cavity, thus accounting for their occasional absence immediately succeeding operation and their subsequent appearance in the wound discharge; and similarly postmortem scraping of the wall may reveal their presence when examination of the pus was negative.

Clinical Picture.—The period of latency varies greatly

from weeks to even years, but the three cases reported illustrate the usual development. Pel¹⁸ reports three cases in which, respectively, tropic dysentery had occurred 11, 15, and 21 years previously.

The onset is usually indefinite and presents no pathognomonic signs; usually at varying intervals, after an attack of amebic dysentery, the following symptom-complex presents itself: The fever is not distinctive, but usually assumes hectic characteristics. It may be entirely absent; Keble¹⁹ reports such a case. In all of the 34 cases in my series fever was present. The pulse varies with the temperature. As a rule, distinct rigors are absent, though the patient complains of chilliness. Sweating is usually quite profuse. The pain is of a dull, aching character, located in the right hypochondrium, and not distinctive of the condition of abscess, though Malbot⁷ insists on its diagnostic importance. In 50% of the cases it is referred to the right shoulder. Cough, either reflex or from secondary involvement of the lung or pleura, may be present. If the abscess ruptures into the lung, the sputum assumes the characteristics noted under "contents of liver abscess," and may contain the actively motile ameba. Nausea and vomiting occur as a sequel of the diseased condition of the liver.

As a rule, there is no distinct jaundice; the patient acquires a yellowish tinge which more resembles that seen in the cachexias, such as carcinoma, than a true jaundice. Dorsal decubitus is assumed, with flexion of the right thigh. The right rectus is rigid. There is tenderness over the area of hepatic dullness. The respiration varies; if the abscess be deep there is no change from the normal; but if it be superficial, with perihepatitis, respiration is thoracic and shallow. According to Smith,²⁰ functional dyspnea is present, especially in those cases involving the right lobe posteriorly.

The diaphragmatic shadow varies, depending upon whether or not adhesions are present, the former giving a more favorable prognosis. If the abscess is near the surface, anteriorly, there may be present some local bulging and edema. The area of hepatic dullness, especially if the abscess be near the surface, is enlarged (see Cases I, II, III). The direction of the increase in area is dependent upon the location of the abscess. As a rule, there is no change in the splenic dullness. Enlargement of the gastric and hemorrhoidal veins is not a usual complication. Little work has been done on the diagnostic value of skiagraphy, but Kelsh and Niemier⁸ believe it of importance in the diagnosis of adhesions, and Rolleston¹⁰ states that the liver shadow is displaced upward and does not move with respiration.

The Blood: All authorities insist upon the diagnostic value of leukocytosis. Osler²¹ believes that the degree is moderate in practically all cases. Scheube²² speaks particularly as regards its usefulness in the differentiation of liver abscess from malaria. Rogers,¹⁷ whose work is especially instructive, believes that the leukocytosis is more marked in small, deep-seated abscesses, and concludes: 1. That absolute leukocytosis is nearly always found in amebic abscess of the liver, but rarely in chronic cases with marked anemia, when only a relative leukocytosis exists. 2. The degree of leukocytosis is very variable, being highest in the most acute cases,

while a low degree is commonly met in cases with insidious onset, in which repeated examinations may be necessary.

Unfortunately, in some of the earlier cases of my series no leukocyte count was made. Those in which it is noted previous to operation follow:

Case.	Number of Counts.	Number of Leukocytes—Average, per Count.
1.....	A. Thirteen	26,730 first admission.
2.....	B. Two	15,100 second admission.
3.....	One	12,800
4.....	Six	11,000
11.....	Two	26,100
13.....	Four	14,900
15.....	One	26,800
14.....	Thirteen	26,900
15.....	Fourteen	19,000
18.....	Seven	21,800
22.....	One	7,280
23.....	One	14,900
25.....	One	18,160
28.....	Seven	26,400
31.....	Two	42,850
32.....	One	12,500
33.....	One	21,800
34.....	Five	20,500
Total....	Eighty-two	21,500

From these I am forced to conclude that as a rule the leukocyte count is somewhat higher than Osler has pointed out and to believe with Rogers that it is almost always marked, though what relative degree is present in those cases in which a low count is recorded I am unfortunately unable to say as no count of the red blood-corpuses was made. No difference in count existing between the first and second admission of Case I is of interest.

The urine a rule presents nothing characteristic, though Pfahler²³ has described crystals, in form resembling tyrosin, but more tapering, in one case.

Complications.—Mention will only be made of the more frequent. Amebic dysentery may be placed under this heading as well as under the etiology.

Perihepatitis and local peritonitis as complications are welcome ones, the subsequent adhesions by binding the liver surface to the diaphragm render much less the probability of infection during operation or manipulation. Godlee²⁴ says that perihepatitis is almost an invariable accompaniment and always exists when the abscess reaches the surface. Involvement of the lung, either through the diaphragm or by direct rupture, partakes first of the nature of a pleurisy and later of a pneumonic condition of the base.

Termination.—The abscess not being operated upon may rupture as follows: [Table of von Rendu, quoted by Scheube.²²]

Cases.	Pericardium.	Pleural cavities.	Lung.	Abdomen.	Colon.	Stomach and duodenum.	Gallbladder.	Vena cava.	Kidneys.	Lumbolac region.
Waring.....	300	—	14	28	15	2	1	—	8	2
Dutroulau.....	66	—	2	10	7	1	1	—	—	4
Houis.....	162	1	11	17	14	3	6	—	—	—
Hasper.....	25	—	4	2	2	—	2	—	—	—
Campay.....	10	—	—	2	1	—	1	—	—	—
Per cent.....	563	1	31	59	89	6	8	4	8	6
		.13	5.5	10.5	6.9	1	1.4	.7	.6	.1

Diagnosis.—Malarial Fever: This is more often confounded with liver abscess than any other disease, but

the absence of periodicity in the temperature, the high leukocyte count, the local pain and the probable history of dysentery render a diagnosis comparatively simple.

Malta Fever: This was the original diagnosis in Case II upon admission to the Division Hospital, but here again the local symptoms and the leukocyte count rendered the determination of suppuration possible. Empyema is a condition not to be overlooked especially if the abscess ruptures into the pleura.

Appendicitis with referred pain may be confounded, as are also at times affections of the gallbladder.

An unresolved pneumonia may give somewhat similar symptoms.

Prognosis.—Manson¹ gives as the mortality for the Indian army during the period 1891-94 as 57.7%. Of my 34 cases 16, or 47%, terminated fatally.

The cause of death may be from the associated dysentery, septicemia or intercurrent disease. Strong²³ cites four cases in which copious intestinal hemorrhage was terminal. The series of Councilman and Laffeur²⁶ gives one more case; and in Case V of my series this was the determining factor.

Treatment consists of evacuation of the cavity, and at present there are two accepted methods of procedure. A great number of men believe in evacuation, where feasible, by means of a trocar, the puncture being made in the eighth or ninth interspace, and the insertion through the trocar of a rubber tube, which is allowed to remain *in situ* for drainage. The other method is incision down to the liver, location of the cavity by palpation or aspiration, followed by incision and drainage. The latter, in the light of modern aseptic surgery, seems the more rational. Acidulated solutions of quinin sulfate, 1 to 500, are recommended for irrigation of the cavity after adhesions have formed.

CONCLUSIONS.

1. This condition should be known as hepatic amebiasis, the words "tropical" and "single" both being faulty in describing it; furthermore, it is not a true abscess as we understand the same.

2. The ameba coli, Lösch, is the exciting cause.

3. The routes of infection are the portal vein, over the peritoneum from the gut to the liver by ameboid motion, and through the common bile duct.

4. The leukocyte count is comparatively high and always a valuable guide in the diagnosis.

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CYST OF KIDNEY SIMULATING OVARIAN CYST

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The following case is one of simple serous cyst of the right kidney, which from the diagnostic standpoint resembled a cyst of the right ovary with a long pedicle.

The patient, Mrs. W. C., aged 34, was referred to me by her physician, Dr. Joseph Swartzlander, of Forest Grove, Pa., and was admitted to the Samaritan Hospital, March 13, 1905. The following history was elicited:

Family History.—The mother died of nervous prostration at 60. One sister died of acute articular rheumatism; another of erysipelas following a burn. The father and two brothers are well. Otherwise no chronic disease in the family.

Previous History.—Patient has had measles and whoopingcough. When 15, she had an attack of acute articular rheumatism, and since then has experienced several slight attacks. Puberty occurred at 12, and the menses were regular, though painful before marriage. She has been married 12 years and has two children, the youngest aged 3. The labors were normal. Since her eighteenth year, the patient has suffered with sharp lancinating pains in the right side which were relieved by lying down, except on two occasions. Variation in daily quantity of urine was not noticed. During pregnancy the attacks of pain did not occur but always recurred after delivery. After the birth of the youngest child, the attacks of pain were renewed and a steadily growing mass was discovered in the right abdominal cavity. This mass was movable and according to her statement "traveled all over the right side."

One week before entering the hospital, the size of the mass apparently decreased and led the patient to hope it would disappear. Instead, it rapidly attained its former proportions. Attacks of sharp pain no longer occurred, but a steady ache persisted. Menses were regular and painless and bowels regular.

The urine was normal in appearance, of pale color, sp. gr. 1010, and the reaction acid. There was no albumin nor sugar present and the microscopic examination was negative.

Operation was performed on March 14, 1905. A median incision revealed a cyst about the size of an ordinary football occupying the right side of the abdomen and having no connection with the uterine appendages. The cyst was retroperitoneal, and after making a small incision into it a quantity of clear, colorless fluid was evacuated. The walls of the cyst were very thin and tense and of a transparent bluish color. On examination it was found to be connected with the right kidney, which was considerably atrophied. No odor of urine was detected.

A second incision was then made, about 2 inches in length, in the right iliac fossa. After the removal of a

¹ Read before the Philadelphia Obstetrical Society, May 14, 1905.

portion of the sac for microscopic examination, the remainder was sutured to the incision to the deep layer of the fascia, and an iodoform gauze drain introduced. The gauze was removed in four days and a solution of methylene blue injected into the sac for diagnostic purposes; but as the urine remained uncolored it was concluded there was no communication with the pelvis of the kidney. Later the sac was swabbed out with a solution of carbolic acid and a drainage tube inserted for a few days longer until the drainage entirely ceased and the secreting sac was apparently obliterated. The symptom of pressure disappeared. The patient made an uneventful recovery and left the hospital on April 9.

According to Morris there are several forms of cyst of the kidney. (1) The small and numerous cysts which occur in granular kidney and which are of pathologic rather than clinical importance, as they never give rise to a marked tumor and are not amenable to surgical treatment. They are in fact retention cysts which result from compression and constriction of the urinary tubules, due to the sclerosis which follows interstitial nephritis. (2) Dermoid cysts which are extremely rare. Morris has never met an instance of such a cyst in the human body. Cases, however, have been reported by Paget, Madelung, Walker and Biggs. (3) Simple serous cysts. (4) Conglomerate cysts or polycystic disease in which the whole kidney is converted into a number of conglomerate cysts of varying size which leave unchanged scarcely any of the glandular structure and give greatly increased bulk to the metamorphosed organ. (5) Hydatid cysts. According to Bland-Sutton the hydatid may attain a very large size and lead to an extensive atrophy of the renal tissue. When small they rarely give rise to trouble or inconvenience during life and their existence is only detected in the course of a postmortem examination. There are good reasons for believing that the greater number of hydatids of the kidney rupture into the pelvis of the organ, the fluid and vesicles passing down the ureters and being discharged through the urethra. As the formation of a hydatid cyst is the result of the entrance into the body, of the ova of *Taenia echinococcus* of the dog, they occur in those countries where men and dogs are brought into intimate association and are especially common in countries where the poorer classes use dog flesh as food, or eat from the same plates as the dogs, i. e., Iceland, Mecklenburg, and Silesia. (6) Paraneuric cysts, or cysts which are external to the capsule of the kidney and are formed in the circumrenal fatty tissues which are intimately adherent to the organ and sometimes communicate with the cavity.

The case reported was shown by macroscopic examination to belong to the third class of simple or serous cysts. These cysts are not very frequently found, Braeckel having collected but 21 cases out of the whole literature from the year 1865 to 1899. In the Hunterian Museum there are three specimens of this sort, and probably many cases have been unrecognized, as they cause no

symptoms except those due to pressure; and according to Morris not one-fourth of them reach a size to attract attention during life. They vary in size from that of a walnut or orange to that of a large ovarian cyst. Their origin is in the cortex of the organ and they project in relief from its surface. The rest of the kidney may be healthy and functionally active; or it may be more or less atrophied from the pressure of the cyst itself as in the case reported. The contents are generally clear or straw-colored, containing a small quantity of albumin and a little saline matter, but rarely, if ever, anything more than the merest trace of urea or other special urinary ingredients. Hemorrhage may take place into the cavity of the cyst, either as the result of injury or of extravasation from the veins which ramify in the cyst walls. These cysts are more frequently found in women than in men. Tuffier gives the proportion as 20 to 3. They occur in either kidney alike, but are rarely bilateral.

Simple renal cysts grow slowly, and do not as a rule attain a size sufficiently great to give rise to a tumor; but a cyst may increase so as gradually to monopolize the greater part of the abdominal cavity. If so, "its point of attachment ceases to be even approximately ascertainable and in the female it may give rise to the idea of an ovarian tumor" (Morris). Pain may follow the formation of the tumor and it is usually of a dull, aching character, giving rise to a sensation of weight limited to the region involved. At times, especially after much exertion, the pain may be more severe.

In this case the pain was not present during pregnancy nor when the patient was reclining, as probably the dragging sensation was relieved at those times.

The difficulty in diagnosis is apparent from the cases recorded. Examination of the urine gives no information. If seen early it may be mistaken for hydatid kidney, for hydronephrosis and other renal tumors, also for hepatic or splenic cysts, or cysts of the omentum, mesentery or pancreas. Later, as the cyst develops and the tumor occupies the lower portion of the abdomen and pelvis, it is very apt to be mistaken for an ovarian neoplasm. Five cases have been reported in which this natural mistake was made.

The treatment is varied. (1) The treatment by puncture which was recommended in earlier days of renal surgery should no longer be employed, as it is uncertain, not free from risk and the cyst usually refills. (2) Incision with drainage. The edge of the cyst is stitched to that of the wound and the secreting surface may be destroyed with pure carbolic acid or nitric acid. Partial and total nephrectomy have been employed, but according to Morris should be reserved for cases in which the cyst is of voluminous size and has in great part destroyed the renal tissue. Tuffier has collected 31 cases in which nephrectomy has been performed; 7 times by the lumbar method with a mortality of 11%; and 24

times by the transperitoneal method with a mortality of 40 %. This seems a sufficient argument in favor of the slower and more conservative method of treatment by incision, drainage, and gradual obliteration of the secret-ing sac.

THE TREATMENT IN THIS VICINITY OF PULMONARY TUBERCULOSIS.¹

BY

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of Elmira, N. Y.

In the latter part of July, 1904, I was consulted by the Rev. H. L. O., of Steuben county, aged about 35, and of native birth. The history given was that of gradual physical deterioration of about two years' duration, accompanied by cough and expectoration, embarrassed breathing, quickened pulse, and night sweats; the latter conditions singly and severally for a year or thereabouts, or until the subject of this sketch was incapacitated for the exercise of his pastoral duties. A physical examination revealed a man of large frame, but anemic and with shrunken muscles. The cheeks were flushed in a manner to suggest fever. Temperature 100°, respirations 26, pulse 100. Digestion was impaired and there was occasional irritability of the stomach. There was flatness over the region of both scapulas, extending outward to the axillary line. On the right side the flatness extended to the apex of the lung. On both sides were moist rales. The clinical picture was that of pulmonary tuberculosis. The diagnosis, however, was not confirmed by an examination of the sputum, owing to my departure the following day upon an extended vacation. The patient was advised to withdraw from all active work. Directions as to dietary and living, together with rest during febrile periods, and life in the open air, were given, and a residence advised near home upon some hill at an elevation above the fog line. The patient passed from my notice until January of the present year, when he again appeared at my office. Improvement had taken place to such a degree that I did not at first recognize him. There had been a marked gain in weight and strength, disappearance of the hectic flush and night sweats, dyspnea, and a return of temperature and pulse to normal. There was little or no expectoration. The rales previously noted had disappeared, and bronchial breathing was normal and unaccompanied by adventitious sounds. Pains previously complained of in the chest were absent; respirations regular and naturally performed. The apex of the right lung had cleared, and in the region of the scapulas percussion elicited resonance but slightly below the normal. Over these regions the vesicular sound was somewhat muffled and in a few small circumscribed areas absent. The mode of living followed in the interval between the first and second visits is best told in the words of the patient, whom I quote:

June 17, 1905: "When I visited you last July I was having night sweats; a red spot on each cheek mornings; was losing a pound a week regularly; strength was so far gone as to be unable to do over a half hour's work at a time. I had a severe cough at times for three or four weeks and then it would let up. Was unable to sleep at night. Chest was sunken in; pulse high; severe pain in each lung, at times difficulty in breathing. You probably remember telling me that my lungs were solidifying, that I was using my right but little and the left was in bad shape. This was also stated to be my condition by a physician from Washington, D. C., and one from Florida. I could not take three deep breaths without causing pain. The general remark at home was

'how bad you look; how fast you are going down.' You told me that in six months I would be a complete physical wreck, as did the two physicians already mentioned. As to my condition today, I have driven my team all the spring from nine to ten hours a day, and in addition, did chores about three hours. I was out every day during the winter driving my team lumbering. My lungs only pain me at times when we have a bad atmosphere; at such times it is hard for me to breathe. I have no fever, no red spots on my cheeks, no night-sweats. Sleep like a log; some nights do not wake up. I still have my off days, but not so far off as formerly, and work all the time, where I used to go to bed in forenoon and afternoon. I am near my normal weight, scarcely any cough. People now say, 'how you have gained; how fat you are; you do not look like a wreck now.' As to my mode of living, have lived in a tent since last September, ate in it, slept in it—my wife and I. I had a wood fire in the tent during the day and let it go out at night. Opened the end of the tent where the bed set and allowed the wind and snow to blow on us all night. Some mornings there would be a bank of snow as high as the bed to jump out in. We used flannel blankets, outing flannel nightrobes, but no night-caps, and less covering than any winter in our lives. We took off all underwear at night, but wore wool during the day. I took a cold water bath twice a day for a long time, but now only at night. I ate beefsteak twice a day and cold beef or cheese for supper. Took a glass of cream three times a day, also six to twelve raw eggs. I ate lots of fruit—about 500 pounds of grapes; had them all winter. Also peanuts and other nuts. I went bareheaded until I nearly froze my ears. Wore my shirts unbuttoned and chest bare all winter, or until winter was nearly gone. Took my exercises regularly three times a day, but only once now, as I get so much exercise in my farm work. I think it safe to say I have done as much as any man around, and more than some who have a hired man; and I am now ahead of any man with my work. I sowed 31 acres of oats, planted 5 acres of potatoes, and have ground nearly ready for planting 10 acres more. Have had help three days. I forgot to say we are about 1,750 feet above sea-level. Bluff Point is less than 1,450 feet. I eat a great deal of butter, but no pie or cake, and drink neither tea nor coffee. My weight was 158 pounds last summer and 184 this spring, and no fluctuations, a steady gain. My tent is a 10-oz. duck, 8 ft. wide by 13½ ft. long, with 4 ft. wall. Hemlock floor on an average of more than 2 ft. above ground. Our stove was a small 'chunk' stove about 3 ft. high, 18 in. long, and 14 in. wide, with one opening on top. As to medicine, I took Dr. Crittendon's cascara tablets for a laxative. I used benzoylacetilperoxid as an inhalant for about half the winter, as I had my nose cauterized five times and throat once. I used this until the parts seemed sound and not for my lungs. This is all the medicine of any description. Took the raw eggs in about two table-spoonsful of sherry wine. I tried other ways and even port wine, but they all made me sick. Have had a great deal of that sick, nauseating feeling, and at first would be so awful tired it was something dreadful. How tired I would be on my off days! I have that yet at times, but nothing like last summer. I have never once thought that work hurt me, but on the contrary have firmly believed it to be one of the leading features in my recovery, especially work in which one is in all positions, doing all kinds of work, easy and violent. There is no tuberculosis in our family on either side."

It is worthy of remark that the wife who shared the work and life of her husband, as narrated, gained over 12 pounds in weight.

The only criticism of the letter is that the writer labored too hard last winter and spring. But, on the

¹ Read at a meeting of the Lake Keuka (N. Y.) Medical and Surgical Association, June 14, 1905.

other hand, the farming operations referred to, and which in my judgment are responsible for, at least in part, the "off days" mentioned, may have served a purpose in eliminating the element of depression of spirits and homesickness that would with almost inevitable certainty have attended the removal from a life of activity among men to a monotonous farm life in a remote region. If physical conditions permit, occupation within bounds is a therapeutic agent of value. Mt. Washington, the seat of my story, is a few miles from Hammondsport. In this connection, reference may be made to Bluff Point, 1,450 feet elevation, where a tuberculous subject a few years ago endured the rigors of winter and the heat of summer in a tent with incalculable benefit to himself.

This paper is presented in affirmation of the argument that patients with incipient pulmonary tuberculosis, those susceptible of response to treatment, can be treated from the standpoint of climate as satisfactorily in this vicinity and contiguous territory on the highlands above the fog line as in the Adirondacks, at Liberty, in Sullivan county; or localities in Colorado, Arizona, and New Mexico characterized as health resorts, and for years the objective points of the tuberculous. The same limitations, however, obtain in this vicinity as elsewhere. Advanced cases and cases in which treatment has been deferred everywhere pursue a common course to inevitable dissolution. The increasing number of private sanatoriums for the tuberculous and the establishment of State hospitals for the treatment of incipient tuberculosis, as at Rutland, Mass.; White Haven, Pa.; Glen Gardner, N. J.; and Ray Brook, N. Y., must be accepted as an earnest of growing faith of ability to treat successfully in the earlier stages cases of the kind under consideration in the eastern and middle States. The efficiency of high altitude is no longer considered an essential, and exile to distant points, with severing of home ties, separation from friends, nostalgia, together with uncertainty as to duration of sojourn in distant places, coupled with doubt as to the ultimate ability to resume former modes of living, are not the factors they formerly were in embarrassing treatment. Homesickness nearly demoralized the troops of Napoleon the Great in Egypt. I believe if the history of large numbers of the tuberculous of the past sent to Colorado and other western points were really known, nostalgia would appear as contributing to mortality second only to the lesion of the lung. In the light of present understanding the essentials of successful treatment obtain equally in the east as in the west. They are outdoor air without stint, proper housing, appropriate and liberal nourishment, as indicated, together with intelligent supervision. Chemic therapeutics is of secondary value, applicable to special conditions and symptoms as they present themselves, and is not the mainstay of treatment. I am not advocating the advantages of this or that locality in the treatment of incipient pulmonary tuberculosis, but am contending for, so to speak, the home treatment of the disease in its early stages at points not far removed from where the disease either developed or was recognized. In other words, the disease can be successfully treated under the same

barometric and thermal conditions as prevailed at the time of its development, and without complicating treatment by the doubt and distress of mind as to future ability to return to the place of home residence endeared by family ties and interests. A residence at a point of elevation of from 1,400 to 3,000 feet is preferable to one of 5,000 or more, with generally attendant dyspnea and accelerated pulse. Wherever treatment is had, whether in the Adirondack region or the uplands of the middle or southern portions of the State, the patient should be brought to understand fully that tuberculosis, even in its early stages, is a severe disease and may require months or a year or more for its successful treatment. In the very nature of things improvement cannot be expected within a few weeks. Such being the case, the patient should be fully informed as to the precise nature of his disease, that the extreme of his cooperation may be secured, and which he will the more willingly render under the realization that his life is at stake. It is a mistake to lull into a feeling of false security by the application of the term "lung fever," "pulmonary catarrh," and other misleading and erroneous terms. Without the patient's cooperation the efforts of the physician will prove of little avail.

It is not necessary in this connection to discuss the pros and cons of institutional treatment. Institutions furnish a haven for many who otherwise would not receive indicated and supervised treatment. But institutions are not a *sine qua non*. Single and solitary cases under hygiene in all that the term implies, and intelligent supervision, will as readily respond to efforts in their behalf. Public institutions are not available for all through paucity of accommodations, and private sanatoriums are beyond the resources of many of our patients. But other than these, whatever place is selected for residence during the period of invalidism and treatment, the fact must not be lost sight of that country life and outdoor life are not synonymous terms. A farm house may prove an undesirable place of residence, and a bedroom there contraindicated for occupancy by a tuberculous subject. Indoor life on a farm or in the country is as objectionable as a life passed indoors in the town. So far as relates to environment, the text repeated and reiterated is fresh air and a life lived out of doors. Outdoor life in sunshine and cloud, temperature high and low, rain and snow, day and night, is the golden rule. A stuffy and unventilated bedroom will negative all other agents for good. Shelter should be had from the direct rays of a fervent sun and high winds, lest the latter abstract warmth from the body. An unfounded prejudice unfortunately exists against night air. In localities such as are under consideration, night air possesses no contraindications or malign features. Its chemistry is the same as that of day, the only difference being the absence of sun and light. Exercise is to be taken within bounds and the limit of fatigue, and varying temperature met by varying clothing. The ordinarily constructed house, farm, or otherwise, does not commend itself as an ideal or even indicated place of abode for the tuberculous. Happily, however, the problem of housing this class of invalids is best met at the present time by the employment of a lean-to tent

and a portable cottage, or the elaboration of all combined. Reference may be made to the Tucker tent, Gardiner tent, Ulrich tent, the Adirondack tent house of Biggs, and the Walker portable cottage as instances of specially designed domiciles for the tuberculous. It does not follow that these cannot be improved upon. They represent, however, the best thought and experience at the present time, and have to commend them their moderate cost, readiness of instalment, and facility of removal from place to place. This applies more particularly to the housing of individual cases.

To those interested in the phase of segregate treatment of the tuberculous of the indigent class by county and city authority, suggestive and valuable data can be found in a monograph published by the Committee on the Prevention of Tuberculosis of the Charity Organization Society of the City of New York, entitled "County and City Care of Consumptives—Some Methods of Housing." Of importance not secondary to outdoor living and proper housing is nourishment and dietetics. This is apparent when it is recalled that the most prominent first effect of pulmonary tuberculosis is progressive emaciation, and that disorders of digestion and nutrition precede for varying periods elicited pulmonary lesion. According to Cornet, the first aim should be to stay the increased metabolism, to make good the pressing deficit, and by heightened nutrition to cover the loss already incurred. Dietary must be adapted to the individual patient and not all the tuberculous can be placed upon an unvarying diet. An unlimited quantity of cod-liver oil and the injunction to eat well and drink much milk should not be the dietetic scheme. By such advice the patient is practically left to his own resources and imagination as to what he should eat or should not, and disappointment ensues in place of success. The story of the scales of increasing weight is a better gauge as to the measure of improvement than the patient's statement as to his feelings or any information gained from the lung through auscultation and percussion.

It is unnecessary at this time, and would be presumption on my part, to present in detail a dietary for the tuberculous. None better than yourselves can appreciate the necessity for generous nourishment within the capacity of the patient to repair waste, make good loss and raise to the highest possible degree of efficiency the vegetative functions of the body. It is better to save the price of railroad fares to distant points in quest of health and spend the equivalent hereabouts in generous and indicated foods, as it is proved that tuberculosis can be treated under favorable conditions on the hills of Yates, Steuben, Allegany, Chemung, and Broome counties, also other counties of New York. Patients with this disease should not be sent upon long journeys into exile at distant points to the depletion of their means, but rather their resources should be reserved for home treatment and expenditure for more bountiful and appropriate diet than that afforded by boarding houses and places of entertainment to which they find their way. We have at our doors and at our command all that is necessary for the treatment of recent tuberculosis. In advanced cases death will occur anywhere. May we not say or permit our patients to exclaim as did the

Syrian captain, "Are not Abana and Pharpar, rivers of Damascus, better than all the waters of Israel? may I not wash in them, and be clean?"

DIPHTHERIA ANTITOXIN EFFECTIVE IN SCARLATINA.

BY

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of Philadelphia.

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In calling attention to the value of diphtheria antitoxin in scarlatina, my object is to suggest that other physicians cooperate in giving the remedy a thorough trial, since my results have been so favorable and there are neither contraindications nor undesirable after-effects.

About three years ago, in an orphanage containing over 300 children, there were many cases of scarlatina following an outbreak of diphtheria. To guard against the dangers of extensive mixed infection and for immunizing purposes antitoxin was liberally employed. The uniform dose, in all cases in which the diagnosis of diphtheria could not be made, was 1000 units. The effects of the remedy upon all the children then showing evidences of disease, as compared with those common to the antitoxin treatment of diphtheria, is a matter of vital professional interest. Too great stress cannot be laid on these favorable results in the non-diphtheric cases.

It is admitted that a few may have been of a mixed character and that in such, the results noted were due to the prompt and complete neutralization of the absorbed diphtheria toxins. But all the cases under consideration were not of a mixed character. Many cases were without doubt scarlatina, having been closely observed by Drs. Charles A. Groff and Sylvester J. Deehan, of the Municipal Board of Health, and Drs. Samuel Wilson and Frederick Eft and myself, of the medical staff of the institution.

More than this, these cases were in the main, scarlatina, pure and simple, in its various forms, and the diagnosis easy enough. In every case the results were favorable, but they were especially so in the anginose type. In the early stages it is difficult to distinguish diphtheria from scarlatinal sorethroat, ulcerative tonsillitis, laryngeal diphtheria (membranous croup), and other kindred throat lesions, all of which are ushered in with a chill, fever, swollen glands, enlarged tonsils, edema of the fauces, pain and general malaise, varying in intensity according to the previous condition of the victim, or the virulence of the exciting cause.

The close resemblance of one or all of these conditions to diphtheria must always modify the value of early observations, as to the effects of treatment, when there is still a reasonable doubt as to the correctness of the diagnosis. But this, I contend, applies only to the

earliest stages, as it does in mixed infection. As a case progresses, the matter of diagnosis tends to simplify itself. This is especially applicable to all sorethroats of scarlatinal origin.

In the scarlatinal anginas the seat of the inflammation is in the fauces or nasal passages, and the grayish-white, or yellowish-brown membrane is usually confined to the tonsils or lateral pharyngeal surfaces. On the other hand, in diphtheria, the membrane is generally on the uvula and the posterior faucial arches. The involvement of the uvula is of special diagnostic value. The membrane may be on the anterior aspect alone, or similarly only on the extreme posterior aspect.

In scarlatina the appearance of gangrene adds materially to the resemblance of the local lesion to the pseudomembrane of diphtheria. In pultaceous pharyngitis likewise, the membrane resembles, in general appearance, the genuine diphtheric membrane; but in both conditions the similarity is superficial and more apparent than real. The membrane is always soft and pliable, and is removed with the utmost ease without leaving a bleeding surface. It appears in patches, as a rule, and is apt to be confined to the tonsils and the adjacent pharyngeal surfaces. It presents intervening erosions which are in marked contrast to the smooth continuity and more elevated appearance peculiar to diphtheria.

In rare cases the resemblance to the membrane of diphtheria is so close as to sustain a doubt as to the proper clinical diagnosis till the appearance of the characteristic scarlatinal rash, which may be delayed beyond the usual 24 or 48 hours. Again, the case may be exceedingly mild and terminate without a rash. In such instances, the subsequent appearance of nephritis in an infected household, a sequel common to the two diseases, is likely to be the only clinical evidence that the case was one of scarlatina.

The similarity of many of the symptoms of scarlatina and diphtheria, apart from the eruption, may explain in part the favorable action of antitoxin in both conditions, in addition to the accepted theory of mixed or superadded infection. The difficulties in the way of an early bedside diagnosis suffice to emphasize the supreme importance of prompt administration of adequate doses of antitoxin.

Early curative doses of antitoxin abort the disease, curtail suffering, and lessen the risk to the patient. Fortunately, in my experience, this applies to the scarlatinal infections as well as to the diphtheric. Pain is relieved and the course of the disease cut short, and perhaps the medical attendant prevented from an unfortunate diagnosis.

One dose, of say 2000 units, would be sufficient in the average case of sorethroat, due to bacterial infection, to effect a speedy cure. There are no contraindications and only good follows such practice.

It must be remembered that the curative value of diphtheria antitoxin is not restricted to removal of the pseudomembrane. It is equally effective through neutralizing the toxins in reducing fever and local congestion which contribute to the patient's suffering and the element of danger. This latter applies to all anginas be they scarlatina, diphtheria, tonsillitis, quinsy, etc. In all throat lesions the serum has proved a most effective antipyretic without adding a single element of danger. It should be remembered that the largest quantities of serum the most severe cases may require, running into 20,000 to 100,000 units, are not depressing to the heart, nor is it attendant with any bad results or sequels.

In all anginas, especially the large class usually designated scarlatinal, antitoxin aborts the febrile action and ameliorates the local lesion, which furnish climate and soil for bacteria. Such was the result in the institution referred to, and since in my private practice. In the cases which appeared, in the completed picture, to be uncomplicated scarlatina without a doubt the effect of the serum was distinctly curative, only relatively less pronounced than in the equally positive cases of uncomplicated diphtheria.

The cases demanding the administration of many thousands of units are comparatively rare, and even when the necessity for such treatment arises, the exigency should be preferable to the sum total of prolonged sickness, trained nurses, drug bills, with possibly a fatal termination.

In hopes that others may employ the antitoxin treatment in scarlatinal cases, and in that manner more firmly fix its value, is my reason for publishing my results.

CHRONIC ENLARGEMENT OF THE TONSILS AS A FACTOR IN ETIOLOGY.¹

BY

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of Westbrook, Minn.

Much has been said and written about the danger of enlarged tonsils. Their presence is readily recognized, and the treatment is simple and almost free from danger. Considering the frequency, however, with which diseased conditions resulting directly or indirectly from enlarged tonsils are met, it is evident that the importance of this subject is not duly appreciated. An observant physician will often notice signs of enlarged tonsils, faucial or pharyngeal, in those whom he is called to treat for other ailments, or in other children in the family who may not be ailing at the time, and if attention were called to this condition and the removal of the tonsils advised, together with other proper treatment, a great many would be spared much unnecessary suffering, and enabled to develop properly.

The faucial tonsils are two almond-shaped bodies sit-

¹ Read before the Southwestern Minnesota Medical Society, June, 1905.

uated between the anterior and posterior pillars. They are composed of adenoid tissue, with 12 to 15 deep depressions into which the mucous membrane, covering the surface of the tonsil, extends. Their function is to help lubricate the bolus of food and thus aid deglutition. They also manufacture leukocytes. The pharyngeal tonsil is a small adenoid body placed in the posterior part of the nasopharynx. This is also covered with mucous membrane and manufactures leukocytes. These bodies are very small and their function in the general economy very small, at their best. When chronically enlarged they are more or less diseased and from their position obstructive, and what little of their proper function they can then perform is insignificant in comparison with the mischief they cause. They interfere with nasal respiration, causing mouth-breathing with its attending evils. The inspired air passing normally through the nasal cavities is filtered, moistened, and warmed before entering the pharynx. Coming through the mouth it is cold, dry, and laden with dust, producing a catarrhal condition in the pharynx, larynx, trachea and bronchial tubes, lessening the resistance to disease germs, and producing a good culture medium. A somewhat similar condition is produced in the nasal passages and nasopharynx which, from a lack of proper ventilation, draft, and drainage, are converted into bacterial incubators. The Klebs-Löffler bacilli find a suitable field and diphtheria develops more readily. The germs of scarlet fever, measles, smallpox, pneumonia, tuberculosis, and other infective microorganisms find here a place peculiarly suitable for their growth and distribution. The swelling of the mucous membrane interferes still more with normal respiration. As Reyburn says, "The power of destroying microorganisms, possessed by the nasal mucous membrane, is lost, and the system is left in a condition which renders it an easy prey to the attacking organisms. This fact is a weighty argument to be added to the long list that might be adduced in favor of breathing through the nose. Mouth-breathing, in fact, is always a symptom of disease and shows that there is in the nasal passages some obstruction to the free entrance of air to the lungs. One of the most frequent causes of mouth-breathing is chronic enlargement of the tonsils. When these are enlarged it shows that they are diseased, their protective power has been destroyed, and their crypts and follicles afford resting places for the lodgment of pathogenic bacteria and bacilli, and the distribution of their poisonous products to the system."

Infection is readily carried from the nasal passages to the eye, including corneal ulcers and other infections as occurred recently in a case under my care, the patient suffering from corneal ulcerations, which would recur every few weeks. After the removal of the hypertrophied pharyngeal tonsil, ulceration of the cornea ceased to occur. Ziegler says, "I think we may safely say 99 % of

corneal lesions take their origin directly from preexistent pathologic processes, affecting the intranasal tissues and secretions."

The orifice of the eustachian tube is partly or wholly occluded from direct pressure or from the catarrhal condition. Hence, the function of this tube, as a ventilator and drainage canal for the middle-ear, is interfered with, and this, together with the extension of the infection into the middle-ear, causes otitis media, and frequently produces deafness and other complications, such as mastoiditis, and even infection of the sinuses, meninges, and brain, and facial paralysis. In a case under my observation two years ago, the parents refused the slight operation necessary to remove adenoids from the nasopharynx in a child of one year. Later they consulted me when there was evidently an acute otitis media developing. This improving, they went away on a visit and while away the child became very sick and soon died from what the attending physician pronounced brain fever. It is well recognized that most of the cases of middle-ear disease in children are due to hypertrophy of the pharyngeal tonsil.

The absorption of toxins from the nasal and nasopharyngeal cavities has much to do with undermining the general health. A condition of leukocytosis is often present. Respiration is labored, and the unnatural position of the mouth, face and chest leads to a deformity which is quite characteristic. There is the drooping jaw, high and narrow arched palate, alveolar contraction, and chicken breast. The deformity of the alveolar process interferes with the teeth. They are irregular and crowded, and being hampered by the general lowered vitality, are often in a poor condition.

Much of the septic material of the nasopharynx is swallowed and the rich bacterial cultures from the crypts of the hypertrophied, and necessarily diseased, faucial tonsils also enter the stomach and produce gastric disturbances, both functional and organic.

In this diseased condition the tonsils, instead of acting as a barrier to the entrance of infection, rather favor it. Their mucous membrane is in an unhealthy condition and often ulcerated. Tubercle bacilli and other disease germs find a ready entrance to the tonsillar tissue where they have a good opportunity to develop in virulence and numbers. From here many of them pass on through the lymphatics leading from the tonsils, and we have tuberculosis of the cervical glands, mediastinum, and lungs. Tuberculosis of the tonsils is not uncommon in pulmonary tuberculosis and good authorities have recommended the removal of the tonsils as a routine prophylactic measure in this disease. According to Spartz, "Interesting autopsy reports show that an infection often results from a chronic, latent tonsillar abscess, by way of the lymphatics, and extending to the peritonsillar region, thence to the mediastinum, leading to pleurisy, pneumonia, pericarditis or pyemia." Endocarditis may also

be produced in this manner and it is not uncommon to find valvular disease present in cases of chronic disease of the tonsils.

When one thinks of the great number of disease germs in the air we breathe and also in our food and drink, and then considers the position of the tonsils at the entrance to the respiratory and digestive tracts, and their connection with many other parts of the body through the lymphatic system, it becomes evident that when in an enlarged and diseased condition they play a most important part as portals of infection.

Baumgarten, Semon, Kruckman and Ruge lay much stress on the part tonsils play in the causation of diseases. Myles says, "The recognition of the interdependence of the tonsils and pathologic conditions in other, sometimes remotely situated parts of the body, represents one of the important advances in medicine during recent decades. A variety of diseases has been traced to the primary involvement of the tonsils, among which are rheumatism, septic infection, tuberculosis, and in a recent report appendicitis and infective jaundice." Wood says, "From the little mass of postnasal lymphoid tissue may develop a startling aggregation of ills."

Kaufman and others have shown that nasal obstruction interferes with mental activity, inducing a condition known as aprosexia. Nursing is sometimes rendered difficult or impossible; the breath becomes offensive, headache is often present and night terrors are not uncommon; enuresis may occur; the voice is often weak, dull and monotonous. When respiration is impeded, oxygenation is necessarily imperfect and this, of itself, predisposes to disease; a marked anemia often results; sleep is disturbed and less refreshing and the child during the sleeping hours does not recuperate as it should. The disease occurring as it does during the developmental period of the individual and at a time when the pharynx is proportionately very small, is an additional and strong reason for early and prompt operation. Anything interfering with normal development, mental or physical, is sure to leave a permanent mark.

Wood states that in a children's hospital of over 300 children with nose or throat trouble, nearly one-half had hypertrophied pharyngeal tonsils and that the hypertrophy was the main cause of their trouble. Chronic enlargement of the tonsils being so common a condition and leading to such dire results, would it not be well if physicians were prepared to operate when necessary? It can generally be done so soon as the diagnosis is made; seldom is anything gained by waiting. If the physician postpones operation, many will put it off until many of the evil results have been established. We should learn to operate as quickly, painlessly, and safely as possible, and people will then dread it less. When the dire consequences of nonoperative treatment are fully understood proper treatment will be readily accepted. In view of the large number of deaths due to diseases of the

respiratory tract, such diseases being mostly caused by bacteria in the inspired air, it becomes imperative that we guard well the entrance thereto. In the crusade against pulmonary tuberculosis let us not forget to keep the throat and nose in as healthy a condition as possible.

DIGEST OF MEDICAL LITERATURE

OPHTHALMOLOGY.

WALTER L. PYLE

THE ETIOLOGY AND PATHOLOGY OF CATARACT.

BY

WALTER L. PYLE.

There have been published recently a number of studies in the pathology of cataract, together with many suggestive inquiries into the general etiology of the various forms of this affection. The dependence of many cases of altered transparency of the crystalline lens on more or less profound constitutional derangements is definitely shown and the importance of prompt treatment of any associate malady is properly emphasized. Although marked confidence in the value of general prophylaxis is now firmly established, there has been little of promise developed in the attempts to devise a strictly nonsurgical treatment of senile cataract. Of interest, however, in this connection are the papers of de Wecker, Badal, and Verdereau. There is still much to be learned from careful study of the cases of spontaneous resorption occasionally observed.

E. Zirm (Wiener klinische Wochenschrift, March 23, 1905), in a recent paper on the nutrition of the lens, discusses the origin of different forms of cataract in disturbances of this nutrition. In order that the lens may retain its transparency it is necessary that the nutrient fluids which surround it should always be of the same density and composition, containing nothing injurious to it; and, as it is nourished by endosmosis, it is all important that the capsule and the underlying epithelium which regulate osmotic changes should preserve their integrity. As illustrating injuries seemingly caused by increased specific gravity of the fluids he cites the experiments of Kunde, who produced haziness of the lens in frogs by injecting solutions of sodium chlorid or sugar into the stomach or under the skin and at the same time deprived them of water; and of Heubdel, who produced the same haziness by introducing powdered substances into the conjunctival sac and beneath the nictitating membrane; and of Bouchard and Charrin, who had the same results from injections of naphthalin into the stomach of rabbits. He also quotes Leber as ascribing glassblowers' cataract to excessive evaporation from the cornea and abnormal loss by perspiration, thus concentrating the aqueous. That it may not be the change in density of the fluids but some other simultaneously produced condition which is responsible for the cataract, has been indicated by other investigators, to whose work Zirm refers. Deutschmann found that it required about 5% of sugar in the eye media to produce opacities, and

in a diabetic case in which there was 8% in the urine and in rabbits to whom enormous quantities of sugar had been fed the percentage in the media was far below the necessary 5%, the inference being that the cataract of glycosuria is not due solely to the sugar in the ocular fluids setting up osmotic changes. According to this observer, it is influenced by primary necrosis of the lens epithelium analogous to that of the kidney epithelium. Salfner believes the cataract of naphthalin poisoning also to be due to injury of the epithelium by a decomposition product, notwithstanding that Peters finds that in the poisoned animal the salts of the aqueous are increased from the normal 0.83% to 0.86% or 0.875%. Cataract due to damage to the osmotic membrane is illustrated by Förster's massage operation. Leber states that the subjacent epithelium is injured when the capsule is unhurt. Demaria (Graefe's Archive für Ophthalmologie, February, 1904) also found experimentally that the production of cataract by massage of the lens is due to lesion of the epithelium and diffusion of the aqueous under the capsule with secondary changes. An hour after operation there was considerable increase in the weight and size of the lens, although there was no visible wound of the capsule. Results similar to those from massage are caused by poisons, the actinic rays of light, and electricity. Zirm refers to the changes supposedly brought about by autotoxins from the intestinal canal, pregnant uterus, and other organs. Peters holds that nutritive disturbances from circulating poisons, etc., are brought about by injury to the ciliary epithelium, which regulates the secretion of the aqueous. Leber (Klinische Monatsblätter für Augenheilkunde, March, 1905), on the other hand, believes the cataract occurs before the ciliary changes. Cataract caused by general diseases, acting through their influence on metabolism, has been reported by various authors. Vossius believes that struma may produce cataract. Bergmeister connects it with gout. Syphilis, malaria, typhus, scarlet fever, tetanus, convulsions, leprosy, and ergotism have been reported as causes. Zirm does not accept Michel's arteriosclerotic theory or the albuminuric theory of Deutschmann.

In the changes of nutrition, due to senility, gaps form in the cortex which become filled with fluid, making what Ammon describes as the "arcus senilis of the lens." This is not true cataract, but in 83% of the cases the disease originates in this zone. Hess (Graefe-Larmisch Handbuch der gesamten Augenheilkunde, second edition) describes three types of senile cataract—that due to degenerative processes, especially of the subcapsular epithelium, that due to deposits in cavities, the cortex and nucleus appearing normal, and that due to intranuclear changes. He believes that disturbance of the whole organism is responsible, rather than mechanical causes. The results of his extensive investigations as to the influence of hypermetropia and astigmatism were negative. He thinks with Knapp that the connection with vitreous disease is more frequent than has generally been supposed. Paul Roemer (Archiv für Ophthalmologie, ix, 2) believes that the lens is remarkably independent of nutritive changes, and he states that the majority of cases of senile cataract has nothing to do with failure of the general health. Osmotic pressure

may vary greatly without affecting the transparency of the lens; in fact, it can be kept clear for months by immersion in oil. He ascribes the pathogenesis of senile cataract to a cytotoxin. It is possible in the generative process of old age that antibodies are set free which possess specific affinity for a definite part of the lens protoplasm. It is the main function of the secretory apparatus of the ciliary body to keep back hurtful substances. Only when this function is imperfectly fulfilled can cataract develop. This explains why all the old do not have cataract. The cause of the injury to the ciliary epithelium is still unknown. That the lens protoplasm possesses specific qualities different from other protoplasm is shown in its agglutinating rabbit's blood, but not the blood of any other animal, in neutralizing the toxin of tetanus, but not other toxins, and in counteracting the hemolytic power of human serum toward rabbit's, pigeon's, or guinea pig's blood.

Hess explains the various types of congenital cataract by disturbances in the separation of the lenticular vesicle from the ectoderm, in consequence of which the fibers not being checked by the limiting capsule, exuberate and degenerate. Dubs believes that lamellar cataract does not form in the first or second year, but that its origin is intrauterine. Peters ascribes it to a primary shrinking, limited to the center of the lens. Leber believes this shrinking secondary. Peters does not believe rickets a cause of lamellar cataract. He attributes it to a toxin which produces the tetany found in association with rickets, this toxin damaging the ciliary epithelium.

In reporting a case of cataract from electric injury, Desbrières and Bary (Annales d'Oculistique, February, 1905) suggest as possible modes of origin chemic alterations, destructive action of the current, alterations of circulation, and a shaking up and rearrangement of the lens elements as the current passes.

Weiss (Klinische Monatsblätter für Augenheilkunde, September, 1904) reports an interesting case of posterior polar cataract following traumatism. A splinter of iron perforated the cornea and wounded the iris without injuring the anterior capsule, which remained perfectly transparent.

In discussing the pathology of cataract, E. S. Thompson (Manhattan Eye, Ear, and Throat Hospital, March, 1905) states that in anterior subcapsular degenerations there is a tendency to involvement of the entire lens, although progress is often slow. The same thing occurs in a short time in cortical degenerations, with the exception of congenital lamellar cataract and of senile cataract, which begins with narrow radiations extending from the periphery, the latter indicating sclerosis rather than degeneration. When large, anterior capsular deposits from iritis cause, through contraction, wrinkling of the capsule and proliferation of the subcapsular epithelium, subcapsular opacities may be due to either proliferation of the subcapsular epithelium or true degeneration of the cortex. Cortical opacities may arise from deposits of granular material in the interstices left by the shrinking of the nucleus. Nuclear changes are almost invariably sclerotic. Posterior as well as anterior cortical and capsular opacities are brought about by plastic exudates.

In senile cataract the changes are usually symmetric. Traumatic cataract is characterized by the rapidity of the degenerative process. Secondary or membranous cataract is composed of capsule, lens fibers, proliferated epithelium from the anterior capsule, thickened fibrous elements from the anterior layer of the vitreous, and fibrous tissue from iris exudates. When present, the latter makes the needling operation difficult.

L. de Wecker (*Annales d'Oculistique*, March, 1905) believes that the prevention of cataract can be attained only by general hygiene, by attending in particular to the free excretion of urea, and to the correction of any error of refraction. Dransart claims that by these means cases have been reduced half, but it is impossible to produce evidence for such statements. De Wecker believes the majority of cases occurs in subjects of arthritic and arteriosclerotic changes. Doubtless something can be done by relief of arteriosclerosis. Some of these patients may have intermittent diabetes, consequently there should be frequent urinalyses. If cataract consists in separation of the lens elements and deposit of fluid in the spaces, there is nothing essentially absurd in attempts to restore normal conditions or at least prevent further progress. With softening or sclerosis a different aspect is assumed. Yet even in this case the masses of cortex may be absorbed and the nucleus fall out of sight, or atrophy of the suspensory fibers may permit dislocation of the whole lens. Restorations of vision reported from health resorts may be due simply to improvement in general health, without special change in the condition of the lens. Claims as to the arrest of cataract by treatment are difficult to maintain on account of its erratic behavior without treatment, the disease often remaining stationary for years, and then lighting up again. As to attempts to restore the integrity of the lens, de Wecker is disposed to look favorably on injections of iodid of potassium 5%, with acoin 1%, or cocain 2%. The injections should not be made subconjunctivally merely, but deeper into the orbital tissues. He prefers this to bathing the eyes twice daily in a 1 to 40 solution of the iodid, as recommended by Badal. His experiments with an extract from the media and internal membranes of the eye have been inconclusive. Verdereau (*Archivos de Oftalmologia*, October and November, 1904), of Barcelona, reports as a result of numerous injections of potassium iodid in one case a rise in visual acuity from $\frac{1}{16}$ to 3.

Augieras (*La Clinique Ophtalmologique*, August, 1904) reports a case of spontaneous resorption of a completely cataractous lens after iritis, the corrected vision = $\frac{1}{16}$, and another case in which peripheral striæ disappeared after several days of physical exercise and very low diet, the patient having at the time acute conjunctivitis. He believes the results in both cases were due to good health, regular exercise, and the local inflammatory process. C. Harms (*Klinische Monatsblätter für Augenheilkunde*, August, 1905) reports a case in which remnants of a lens dislocated into the anterior chamber were examined in the eyeball, which was enucleated on account of the pain of secondary glaucoma. He refers to von Hippel's belief that cataract resorption is due to obliteration of capsular epithelium, thus giving access of aqueous to the interior, and also to Axenfeld's opinion

that it is the final stage of Morgagnian cataract, independent from the capsular epithelium. Harms believes from study of his own case that through liquefaction of the lens substance the epithelium is deprived of support, and in the course of years is detached by movements of the loose capsule.

REVIEW OF LITERATURE.

Staining of the Conjunctiva by Protargol.—S. Snell (*Ophthalmoscope*, August 1, 1905) reports two cases in one of which the drug had been used nearly two years and in the other almost five years. The ocular conjunctiva was rendered a dark olive tint and the conjunctiva of the lower lid was almost black. In each the thickening of the palpebral conjunctiva made each lower lid appear somewhat full. He has never seen so decided staining from silver nitrate. The cases indicate that protargol needs care in its use, the patient keeping himself under close observation. [H.M.]

Varicella of the Cornea.—Ocular complications, and particularly corneal involvement, being of very rare occurrence in chickenpox, H. E. Oppenheimer (*Deutsche medicinische Wochenschrift*, 1905, xxxi, No. 21, 883) reports such a case having been observed by him. The patient, a girl of 2, was passing through a typical attack of the disease and was covered with the dried up remains of large numbers of vesicles. On the sixth day it was noticed that her left eyelid was inflamed; it was red and edematous and could not be raised spontaneously. When elevated, the ocular conjunctiva beneath it was seen to be injected and a number of small hemorrhages were seen to be in different parts of it. The pupil was myotic, but perfectly rounded; the cornea somewhat hazy, and at the lower, outer part of it a small vesicle with a grey floor could be seen. Its epithelial covering was somewhat roughened, as strings of mucus were attached to it every time the lid was raised. By the next day the vesicle had ruptured, a superficial ulcer covered with mucoid secretion being found in its place. Instillations of atropin, applications of hot 1% boracic acid solution and 2% xeroform ointment produced prompt healing. The author believes this to have been a chickenpox vesicle, scrofulous ulceration being excluded by the superficial position of the ulcer, the rapidity of recovery and the good general health of the patient. [E.L.]

Radium in Trachoma.—J. C. Beck (*Annals of Ophthalmology*, July, 1905) reports three cases, two of which were completely and one partially cured by applications of tubes containing radium bromid. The least quantity that one should use is 50 mg. of a 10,000 radioactivity. The stronger the radioactivity the better the results, the highest used for therapeutic purposes is that of 1,000,000 radioactivity. Radium acts best on superficial lesions, particularly on glandular and lymphoid tissue. The hermetically sealed tube is placed in contact with the tissue for 10 minutes to 30 minutes daily or less often. The writer has not had a single burn, but a marked reaction in one case after long exposure. Mechanical irritation from contact may be mistaken for reaction from the radium. [H.M.]

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Imbecile immigrants were discussed at the recent New York conference on immigration by Robert S. Watchorn, commissioner of immigration. He deplored the fact that while the law excluded idiots, it did not mention the imbeciles or the feeble-minded who were equally unfit for citizenship. There is no dividing line between these classes, so that borderland cases are admitted through political influence, whereas they might be considered to be idiots. It seems that such fine technical distinctions really defeat the purpose of the law. The word idiot has a general as well as a technical meaning and includes the imbeciles and even the feeble-minded. The law evidently uses it in this broad sense, for it is absurd to think its framers would have thought that imbeciles and the feeble-minded were proper kinds of immigrants. It was designed to exclude persons who would become public burdens, but it is well to inquire whether it is not now time to extend its application and to exclude those who are so feeble-minded that they cannot be trusted with the franchise even if they are apparently able to make a living with a pick and shovel. These almost brainless animals are pouring into the country at a tremendous rate and will propagate their type, which is a healthy normal one, even if lacking in intelligence. It is beginning to be known that education will not make these men more intelligent and that we are filling the country with unassimilable men who can never become good citizens or ancestors of such. Democracy requires brains. Wherever there is a lack of intelligence, there do we find political corruption in every form and a perversion of the democratic form of government. Hordes of Russians can be drilled as soldiers to fight those who are struggling for freedom and could be used to destroy our freedom. We seem to be laying up trouble for posterity.

Illiteracy and lack of brains are never treated together in the numerous statistics on the one subject or the other. A bulletin on illiteracy has recently been

issued by the Bureau of the Census, and contains some interesting data on this subject. The figures show that there is a general improvement in the United States, but the details are of no significance. The least illiteracy is among natives, yet those born of foreign parents are less illiterate than those born of native parents, probably because the foreigners remain in the cities where schools are more numerous and conveniently located. Country natives not infrequently are unable to get to school. The next class is the foreign white, then come the Japanese, Chinese, negroes, and Indians. The most interesting part of the bulletin is a table of European illiteracy, copied from the 1899 report of the United States Commissioner of Education. It is known that the largest average brains are in the northern part of Europe, the center being in Scandinavia or thereabouts. Of course there are large and small variations everywhere, but the average brain weight of a nation seems to diminish in proportion to its distance from this hypothetical brain center. This fact has been known a long time.

That intelligence in a general way is due to the size of the brain is also well known. Consequently it would seem that if people are illiterate in their native land, it may be due not so much to lack of opportunity as to lack of capacity. This is rather borne out by the following table of the number of illiterates per 1,000 in the various countries, the numbers increasing in a general way from the brain center outward to the regions which are now furnishing our immigrants:

Sweden and Norway	1.1	Ireland	170
German Empire	1.1	Austria	238
Switzerland	3.0	Hungary	281
Denmark	5.4	Greece	300
Finland	16.0	Italy	383
Scotland	35.7	Russia	617
Netherlands	40.0	Spain	681
France	49	Portugal	790
England	58	Servia	860
Belgium	128	Roumania	890

Quack remedies in 1816 are well described in a book on Hypochondriasis, published about 1820, by Dr. George R. Rowe, F.R.C.P. and F.R.C.S. On page 80 he refers to the use by a patient "of various empiric remedies, which are daily offered to the public as infallible and innocent in their composition, although they contain drugs of the most pernicious nature, and so far from being an antidote, become a powerful auxiliary to the rapid progress of that disease they are warranted to cure." The newspapers of a century ago were far worse offenders than they are today, for all the advertisements were the boldest kinds of frauds, and moreover the venders used the press to accuse each other of dishonesty and various misdemeanors. The issues of London papers of November, 1805, which contained the accounts of Nelson's death and victory at Trafalgar, are said to contain quack advertisements which are more interesting now than the war news:

HOWLEY'S INVALUABLE FEVER PILLS.—BEING the best and safest Medicine ever offered to the Public for the certain and speedy CURE OF FEVERS, PAINS in the STOMACH, and VIOLENT HEADACHES, even when affecting the Senses.—Two only, at once taking, cured Mr. John Sartin, a shoemaker, supposed to be on his death-bed, of a violent Fever, of which his wife had died, and he never ailed anything for 20 years afterward. Mr. Farmer, of Court street, Whitechapel, many years ago, was cured by them within two days, of a violent headache, which affected his senses, and so as to have had no return since, of which he hath given a Certificate.

Human nature has not changed much in a century—it does not change in millenniums, for the old Adam is still in us all. The present-day frauds differ in style from these old ones, as they differed from the medical mountebanks of the middle ages and these from the ancient witches, but they are all alike in principle and will be with us always. As long as there are fools to be fooled there will be frauds to fool them. Nevertheless it does seem that the evils are less than they were a century ago. There is cause for optimism. Indeed, the history of quackery does show a steady improvement and we need not worry about the future. Though we cannot end it, we can keep pounding away to limit its evils.

"**Preying on the Incurables**" is the title of the last of the remarkable articles which have appeared in *Collier's Weekly* (January 13). This is the sad and really ghastly side of the nostrum trade. Dying men will buy anything suggested to them as a possible cure, and most uncanny advantage is taken by the quacks. Were it not for the incurables, indeed it is quite likely that at least half the nostrums would be unprofitable. This last article is painful reading, but it is sure to do good in creating a public conscience. Then the incurable might

be protected from his own folly, but so long as he is considered legitimate prey the miserable business will go on as it always has. The drowning man grasps at a straw, and there is always a scoundrel ready to sell him one. A great deal of these frauds make use of the mails, and the Postoffice Department is busily occupied in running them down. In time the government will be able to check or even destroy this part of the business, but it is desirable to have local authorities act, as in the case of the notorious quacks prosecuted by the New York County Medical Society. A general movement all over the country is desirable. The credulity of the victims in accepting the wildest kinds of absurdities is the astounding part of recent revelations. Someone has neglected a duty in failing to enlighten the public, and a campaign of education among laymen is an essential for a successful fight.

Are patent medicines dangerous? is asked by the *National Druggist* in its December issue. The editorial appears in the *New York Commercial* of December 20, 1905, apparently as a paid advertisement. It is intended to show that the evils of nostrums are much overestimated and bases its argument upon the few recorded deaths it can collect from newspaper clipping bureaus. Even including fatalities from carbolic acid and similar poisons, it counts up but 292 violent deaths. As it estimates 25 daily sales in each of the 40,000 drug stores of the country, or 365,000,000 per year, the sudden deaths are not of any moment. If they were the real danger the point would be well taken, but no one ever seems to have accused nostrums of instantly killing the buyers. The evil is in the fact that they do no good, but allow the patient to progress to a slow death if he is really very ill. The matter is mentioned merely to express regret that the journal should have taken this stand in favor of the nostrum trade. It places the druggists of the country in the category of quacks instead of passive sellers of what the people demand. The coarse things said of the medical profession are unworthy of respectable journalism and we hope will never be repeated.

Jerome Cochran and His Plan of Sanitary Government.—An anonymous correspondent, signing himself "M. D.," has enclosed an editorial of the *Mobile Register*, under date of December 5, furiously attacking *American Medicine's* editorial strictures on sanitary government in Alabama. Our unknown friend asks us to reprint the *Register's* editorial. There are several points of undoubted merit in this assault on our editorial judgment, but we cannot reprint it or make categorical reply, because another and an authoritative champion of Alabama's sanitary institutions has sent us a communica-

tion which we feel bound to print, and which covers the same ground, with the exception of one important particular. Of all the various and voluminous ignorance imputed to us by the *Register*, one sort would fill these editorial rooms with most burning shame. The *Register* asks "Has *American Medicine* never heard of Dr. Jerome Cochran?" Civic pride is usually shocked, and sometimes angered, that the fame of a distinguished citizen has not overspread the world, and often, on the other hand, an intelligent community is astonished to learn that a fellow-citizen, wholly misunderstood or half-appreciated at home, wields a powerful influence far beyond the borders of his State and the circle of his acquaintance. The reputation of a physician seldom travels far; it is confined, by the nature of his calling, to a narrow circle. To have been well known at home and abroad while living, and to be familiarly talked about ten years after his death, is a very remarkable distinction for a physician. The year 1831 includes a principal date in the chronology of American medicine, for Jerome Cochran was born in that year. Nature is not so prodigal of large gifts that one may overlook such a man and at the same time pretend to know the history of American hygiene. Without a knowledge of Cochran's life and work, *American Medicine* would not have aimed so severe a criticism at the sanitary institutions of Alabama. If Alabama had not had a chance to excel, it would have been unfair to distinguish Alabama among the four States whose sanitary government we criticised at the same time. But Alabama had a superb advantage and that advantage was Jerome Cochran. The most important of Cochran's achievements was that he organized the medical men of his State with extraordinary thoroughness, making them recognize and profess their *civic obligations* as coextensive with and inseparable from their professional duties. Under his leadership the medical profession of Alabama became responsible for preventive medicine as well as for curative medicine, and the people of Alabama, in General Assembly, ratified this fine conception of medical science as a political instrument. What have the people of Alabama done with their legacy from Jerome Cochran? Digged in the earth and hidden it—added nothing to it—ceased even the enumeration of births, deaths, and causes of deaths among the citizens—rejected the counsel of a united medical profession pledged to serve the public in preventive medicine—lost the best start ever offered to an American State—slept till the world was a lap and a half ahead, and when prodded into half-awakeness by a rude criticism, mumbled about Jerome Cochran, as if Jerome Cochran, ten years dead, could now, as he did in life, compensate their inertness.

The Medical Society of Alabama and the Sanitary Government of the State.—The same editorial which aroused the *Mobile Register* into a reminiscence of Jerome Cochran called forth from Dr. W. H. Sanders a letter, which is published in this issue. Our objectionable editorial said this and no more about Alabama: "The State Board of Health of Alabama is a mirage, a figment of medical imagination, believed in by its sponsors, but of little or no utility to the people of Alabama." Now the State Board of Health of Alabama is the Medical Society of Alabama, and the chairman of the Committee on Sanitation is the State health officer. Dr. W. H. Sanders is the State health officer by virtue of his election by the State Society to the chairmanship of a special committee. Dr. Sanders' defense of the State Board of Health is therefore a defense of the medical profession of Alabama, the sponsors for a scheme of sanitary government which, we have said, is a figment of medical imagination, having little or no utility. The particulars of this arraignment are not included in our editorial, but they can be found by reference to former editorials in the last volume of *American Medicine*, and can be conveniently verified by reference to Dr. Sanders' letter. Dr. Sanders points with great pride to the history of Alabama quarantine against yellow fever, but on every other matter in the scope of practical hygiene he is either silent or else he makes excuse for confessed deficiencies, or else he charges other States with equal sanitary delinquency. The whole gist of our former argument can be briefly reconstructed on Dr. Sanders' defense. It is not necessary to deny that Alabama quarantine has prevented epidemic yellow fever. The proposition cannot be proved or disproved. If the exclusion of yellow fever were perfect, Alabama quarantine is, in our judgment, excessively rigorous and expensive. No rejoinder need be made to the argument that other States neglect, as Alabama does, causes of current mortality and morbidity. But when, in extenuation of delinquencies confessed, Dr. Sanders pleads that the people of Alabama are not sufficiently enlightened, the responsibility is shifted, we think, unfairly.

There are no reports on the vital statistics of Alabama as to population, births, deaths, or morbidity. There is no effective notification law, or at least no regular notification. There is no laboratory of hygiene. The vaccination law is inoperative. No systematic investigations are made of causes of disease prevalent among the people, and very little effort is made to control them. Granting Dr. Sanders' statements to be irrefutable on every point, the conclusion is irresistible that Alabama lacks the essentials of a practical public health equipment, and Dr. Sanders says in explanation that

popular intelligence has not yet grasped their necessity. This may be true, but if true, it is only another way of saying that the State Medical Society has failed to educate the people of Alabama. Is the public mind more refractory in that State than elsewhere? or its tutors less diligent? Has registration of births and deaths ceased because of popular ignorance? Physicians are the registrars, and registration is not forbidden. Why are infectious diseases not notified? The consent of the people is not withheld. Why is there no laboratory of hygiene? The people do not object to being informed about the safety or infectiousness of their drinking water. They prefer the services of physicians who inquire into the causes of sickness and utilize modern aids in diagnosis. Nearly a quarter of a century ago the physicians of Alabama publicly confessed their political obligations, and the Legislature accepted their political leadership in all that concerned public health. The Medical Society of Alabama was at that time the strongest professional association in America, and public opinion in Alabama seemed at that time well enlightened. Nowhere has sanitary government had a beginning so auspicious. Of those who participated many have passed away, but in 1883 they "sat in the aurora of a sunrise that might have dimmed all the stars." When and where did that ignorance intrude which defined public hygiene as beginning and ending in quarantine against yellow fever, and transformed Jerome Cochran's virile and vital scheme of sanitary government into a "mirage, a figment, a thing of little or no utility to the people of Alabama." Let us repeat that the present status of sanitary government in Alabama might not interest us especially, and would not have been distinguished unfavorably if Alabama had made substantial progress on the unique advantage which was hers in 1883, and which she has suffered not only to rest, but also to decay.

Euthanasia still occupies the mind of Dr. Anna Hall, of Cincinnati, who has introduced a bill legalizing it through Representative Hill, of the Ohio Legislature. Considerable indignation was expressed by several legislators, who considered it a reflection on their intelligence to be even called upon to pass upon such an impossible proposition. One newspaper has interviewed numerous physicians in various cities and recorded a unanimous storm of protest, as was to be expected. The president of Harvard University has placed himself on record as favoring this uncivilized and therefore inhuman measure and has brought down upon his head some well-deserved scoldings. There is a new phase of the matter which has recently been brought out, and that is the chance such a law would give to murder undesirable rich relatives who are living too long to suit their impecunious and crim-

inally minded heirs. This of itself would condemn the suggestion did it not condemn itself for the many reasons we have already mentioned. The surprising part of the matter is the fact that intelligent people can take to such an unnatural thing. The sacredness of every life from the moment of conception to its final natural demise in spite of our efforts to preserve it, that is the keystone of civilization. Destroy it and the whole arch falls.

Preventable diseases in war were considered by the Section on Hygiene and Sanitary Science at the last meeting of the American Medical Association, and the following resolution was referred to and adopted by the House of Delegates. It no doubt expresses the opinion of the medical profession of America:

WHEREAS, The science of prevention of disease having been long established on a solid scientific basis, it is now time that this fact be recognized by the national legislature; be it

Resolved, By the American Medical Association, that the attention of the people and of their representatives in Congress be directed to the fact that no adequate provision by law has yet been made to avoid in time of war the preventable deaths by disease of the soldiers who offer their lives for the preservation of the nation; be it further

Resolved, That this association heartily endorses the statement of the President of the United States that the people have not compelled their representatives to provide adequately in advance for the medical system in its personnel, its material, its organization, and its physical instruments necessary to make that organization effective, which alone, if prepared in advance, will obviate the trouble which otherwise is certain to come if we have a war. (P. 279, Proceedings.)

These resolutions are impressive, but are given renewed interest by recent remarks of the President upon the occasion of the presentation of a medal of honor to Captain Church, of the medical department, for conspicuous bravery in the Santiago campaign. It is quite evident that the administration has no patience with those representatives who are deliberately objecting to the passage of the bill which is designed to remedy part of the present deplorable defects. It is doubly evident that they are acting in a manner which is sure to bring upon them the condemnation of the thinking people of the country. Mr. Hull, of Iowa, is the chairman of the Military Committee, and we hope that he will be able to convince his colleagues that the people are in a serious mood when it comes to a matter of protecting the lives of soldiers in war. There may be difference of opinion on Statehood and rate regulation bills, and matters of politics or statecraft, but in this matter of making the army efficient and expandable, without collapse, there is or should be complete unanimity. It is too late to begin when war begins; it must be done now, and it is a serious error to delay longer. The medical profession has spoken—let the lay press voice the demands of the people at once.

AMERICAN NEWS AND NOTES

GENERAL.

No Fever in Panama.—Governor Magoon of the Panama canal zone says there has not been a case of yellow fever in Panama in 74 days. The health of the canal zone is excellent.

Accidents on Railroads.—A bulletin issued by the Interstate Commerce Commission shows that during the months of July, August, and September last 1,053 were killed and 16,386 injured among passengers and employees of steam roads in the United States.

Fifteenth Annual Medical Congress.—Interest is increasing in the approaching session of the International Medical Congress, which is to be held in Lisbon, April 19 to 26. John H. Musser, of Philadelphia, is Chairman of the National Committee, and Ramon Guiteras, of New York City, is the secretary, to whom all applications for membership in the congress and communications regarding papers should be addressed. The sailing date of the American party is April 7, by the North German Lloyd steamship König Albert. The arrangements are in the hands of Charles Wood Fassett, of St. Joseph, to whom applications for reservations should be made.

Public Health Menaced.—In the course of an official inspection at Boston last week, United States Commissioner of Immigration F. P. Sargent expressed the opinion that the public health was menaced by the existing conditions of immigration, due to the exposure of healthy aliens to aliens that are diseased. He said that the only method of dealing with the problem is for the United States to place competent medical inspectors at the port of embarkation, whose duty it would be to ascertain first of all the physical fitness of the emigrant for entrance into this country. Such a method not only would protect in great measure the American public from contact with aliens exposed on shipboard to a contagious disease, but it would protect the healthy aliens from contact with such disease. Instead of spending his time and his money on the long voyage across the Atlantic only to have all his hopes dashed by the deportation order of a United States official, Mr. Sargent pointed out the immigrant would be made to realize that he could not enter this country.

EASTERN STATES.

No Diphtheria Epidemic at Harvard.—The medical visitor of Harvard University states that the cases of diphtheria among the students are very mild and that there seems little danger of contagion. There are now 18 patients ill with the disease. The first cases appeared about ten days ago and there were rumors of contagion.

NEW YORK AND VICINITY.

Blaze Endangers 800 in Hospital.—Eight hundred patients in Bellevue Hospital were endangered by a fire in the laundry building early Sunday, yet through the quiet and effective work of the hospital fire brigade and the regular firemen, who responded with muffled bells, only a small number in some of the outlying pavilions were awakened.

PHILADELPHIA, PENNSYLVANIA, ETC.

Nurses in Public Schools.—Mayor Weaver has expressed no opposition to the Board of Education's proposition to establish a corps of trained nurses to supplement the public school medical inspectors. He had not had time to consider the matter fully, but was averse to supplanting the medical inspectors with trained nurses. He was in favor of any practical plan for safeguarding the health of pupils, but does not believe in establishing a hospital in connection with every school.

Disinfecting the Leased House.—The Philadelphia Board of Health offers to disinfect any house on a change of tenants. The board is doing the work of disinfection with efficiency. The one difficulty is that infectious diseases are not reported, and that realty owners do not understand the absolute necessity of guarding against the transmission of disease from one tenant to another by disinfection at each change of lease.

SOUTHERN STATES.

Yellow Fever on German Cruiser.—When the German cruiser Bremen arrived at the mouth of the Mississippi river, on the way to New Orleans, a case of yellow fever was reported on board. Doctor Lamb, in charge of the quarantine station, ordered the ship detained and screened the patient. Orders have been sent to have the vessel thoroughly fumigated. She will be detained for six days.

For a Larger Hospital.—There was simultaneously introduced in the Maryland House and Senate last week a bill which, it is claimed, is strongly endorsed by the medical profession throughout Maryland. Through its passage the University of Maryland School of Medicine, which completes a century of its existence next year, hopes to secure an annual appropriation of \$50,000 for the years 1906 and 1907 for the erection of a handsome extension of the University Hospital on West Lombard street, which will be like the present hospital in exterior appearance, and will include an obstetric clinic, a new amphitheater, new isolating and other wards. The medical faculty of the university will raise for this purpose \$200,000, and will ask the State to furnish the balance.

WESTERN STATES.

Measles Stops Regiment.—Orders were received at Fort Logan from the War Department at Washington to postpone indefinitely the departure of the Second Infantry for the Philippines. The regiment was under orders to start for San Francisco on January 24. The postponement was necessitated by the breaking out of measles and mumps among the soldiers, and they will be quarantined at Fort Logan.

Smallpox Among 500 Insane.—Smallpox has broken out in the Central Insane Hospital main building, at Jacksonville, Ill., where over 500 patients are housed. All visitors to the hospital will be prohibited from entering the building for the next 30 days. A quarantine on the main building will continue for 14 days. Surgeons will vaccinate the entire colony at the hospital at once. The hospital is in the care of Dr. E. F. Baker, State inspector, who will visit the insane patients twice a day to watch the progress of the disease.

OBITUARIES.

William H. Harrison, aged 65, January 19, from Bright's disease, at his home in Brunner, Texas. He was graduated from the Bellevue Hospital Medical College. During the yellow fever epidemic in Louisiana in 1878, Dr. Harrison gave his services until he himself was stricken with the disease. During the Civil war he served as assistant surgeon in the Fourth Wisconsin Volunteer Cavalry.

William G. Porter, aged 60, January 30, from pneumonia, at his home in Philadelphia. He was graduated from the University of Pennsylvania in 1868. He was former secretary of the Academy of Surgery, former recorder of the College of Physicians, a member of numerous medical societies, and a surgeon of the Presbyterian and Philadelphia Hospitals for 30 years.

Berthold B. Pirosh, aged 52, January 25, at his home in Chicago, Ill. He was graduated from the University of Königsburg, and from the Imperial University, St. Petersburg, Russia, in 1877. He was a member

of the Illinois Medical Association, the American Medical Association, and various German Medical Associations.

J. W. Fugna, aged 71, January 27, at his home in Vinton, Va. He served as a surgeon in the Confederate army during the Civil war and was one of the best known physicians in the South.

William Heverin Hobson, aged 36, of Philadelphia, January 30, from typhoid fever, at the Samaritan Hospital. He was graduated from Jefferson Medical College in 1895.

William C. Poe, January 20, at his home in Baltimore, Md. He was graduated from the Maryland University School of Medicine, Baltimore, Md., in 1865.

William N. Klemmer, aged 47, January 23, from pneumonia, at his home in Germania, Pa. He was graduated from Jefferson Medical College in 1893.

Edmund H. Evans, aged 45, January 26, suddenly, from uremia, at his home in Philadelphia. He was graduated from Jefferson Medical College in 1889.

Hiram S. McConnell, January 15, at his home in New Brighton, Pa. He was graduated from Bellevue Hospital Medical College in 1875.

Frederick Ensor, aged 73, January 20, at his home in Upwey, Dorset, Canada.

C. H. Pearson, January 25, at his home in Avon, Ill.

THE PUBLIC SERVICE

Changes in the Medical Corps of the U. S. Army for the week ended January 27, 1906:

Captain **CLYDE S. FORD**, assistant surgeon, is relieved from duty at Fort Barrancas, and will proceed to New York City and report in person to Lieutenant-Colonel Henry S. Turrill, deputy surgeon-general, in charge of the medical supply depot in that city, for duty as assistant at that depot.—Captain **PERCY M. ASHBURN**, assistant surgeon, and First Lieutenant **CHARLES F. CRAIG**, assistant surgeon, are appointed a board of officers to meet at Manila, P. I., for the purpose of studying tropical diseases as they exist in the Philippine Islands. The board will be governed in its proceedings by such instructions as it may receive from the surgeon-general of the army.—First Lieutenant **EDWARD P. ROCKHILL**, assistant surgeon, is advanced from the grade of first lieutenant to that of captain, with rank as captain from January 9, 1906.—**JOHN D. MILLIKEN**, dental surgeon, is granted leave for ten days.—First Lieutenant **GEORGE H. SCOTT**, assistant surgeon, is granted leave for one month, to take effect upon his being relieved from duty at San Francisco, Cal.—**FREDERICK S. SIMMINS**, sergeant first class, Fort Slocum, will be sent to Fort Washington, to relieve Howard R. Jackson, sergeant first class, who will be sent to Fort Monroe for duty. Upon arrival of Sergeant First Class Jackson a sergeant of the hospital corps, Fort Monroe, designated by the surgeon, will be sent to Fort Slocum for duty.—Captain **WILLIAM N. BISPHAM**, assistant surgeon, leave granted October 9 is extended one month.—**G. PARKER DILLON**, contract surgeon, will proceed to Hot Springs, Ark., and report to the commanding officer, Army and Navy General Hospital at that place, for observation and treatment.—**CARL S. BENCHE**, sergeant first class, Fort Leavenworth, will report to the commandant of the military prison at that place, for duty.—Captain **PAUL F. STRAUB**, assistant surgeon, is relieved from duty with the Isthmian Canal Commission, to take effect upon the expiration of the leave granted him by the governor of the Canal Zone, and will then report to the surgeon-general of the army for temporary duty in his office.—First Lieutenants **JOHN J. REILLY**, **JAY RALPH SHOOK**, and **COMPTON WILSON** will report to Major William H.

Arthur, surgeon, president of the examining board, at the Army Medical Museum Building, Washington, D. C., for examination for advancement.—**HERMAN LOTH**, sergeant first class, Presidio of Monterey, Cal., will be sent to Fort Mason, to relieve Frank Holt, sergeant first class, who will be sent to the Presidio of Monterey, Cal., for duty.

Changes in the Medical Corps of the U. S. Navy for the week ended January 27, 1906:

E. L. JONES, assistant surgeon, appointed assistant surgeon, with rank of lieutenant, junior grade, from December 30, 1905.—**J. E. PAGE**, surgeon, commissioned surgeon from April 20, 1904.—**W. H. BELL**, surgeon, commissioned surgeon from May 20, 1905.—**E. M. BROWN**, passed assistant surgeon, commissioned passed assistant surgeon from May 8, 1905.—**M. W. BAKER**, passed assistant surgeon, commissioned passed assistant surgeon from July 10, 1905.—**J. F. LEYS**, surgeon, detached from the bureau of medicine and surgery, navy department, and ordered to the Naval Hospital, Norfolk, Va.—**G. PICKRELL**, surgeon, detached from duty in charge of the Naval Hospital, San Juan, P. R., ordered home, and granted sick leave for three months.—**J. F. MURPHY**, passed assistant surgeon, commissioned passed assistant surgeon from May 18, 1905.—**J. H. HOLLOWAY**, passed assistant surgeon, commissioned passed assistant surgeon from September 26, 1905.—**L. H. SCHWERIN**, acting assistant surgeon, appointed acting assistant surgeon from January 28, 1906.—**C. F. STOKES**, surgeon, detached from duty at the Naval Medical School, Washington, D. C., February 7, and ordered to duty in command of the Naval Hospital, San Juan, P. R., sailing from New York, N. Y., about February 10.—**W. C. BRAISTED**, surgeon, detached from the bureau of medicine and surgery, Navy Department, February 7, and ordered to duty at the Naval Medical School, Washington, D. C., and to additional duty as a member of the anatomical board of the District of Columbia.—**J. G. FIELD**, surgeon, detached from the Celtic and ordered home to wait orders.—**E. L. JONES**, assistant surgeon, ordered to the Naval Hospital, Mare Island, Cal.—**W. N. McDONELL**, assistant surgeon, detached from the naval station, Culebra, W. I., and ordered to the Maine for temporary duty, and thence to the Celtic.—**H. F. HULL**, assistant surgeon, detached from the Naval Hospital, New York, N. Y., and ordered to the Celtic for temporary duty, and thence to the naval station, Culebra, W. I., and to additional duty on the Alliance.

Changes in the Public Health and Marine-Hospital Service for the week ended January 24, 1906:

G. M. GUITERAS, surgeon, granted ten days' leave of absence from January 27, 1906.—**J. B. GREENE**, passed assistant surgeon, granted leave of absence for two months and twelve days from January 18, 1906.—**M. H. FOSTER**, passed assistant surgeon, granted leave of absence for one month from January 23, 1906.—**T. F. RICHARDSON**, passed assistant surgeon, granted three months' leave of absence from January 20, 1906, with permission to go beyond sea.—**T. F. RICHARDSON**, passed assistant surgeon, relieved from duty at Savannah, Ga., effective January 31, 1906.—**T. F. RICHARDSON**, passed assistant surgeon, excused from duty, without pay, from April 30, 1906, to February 15, 1907, for the purpose of undertaking the sanitation of the North coast of the Republic of Honduras.—**F. H. McKEON**, assistant surgeon, temporarily relieved at San Francisco Quarantine Station, and directed to proceed to Columbia River Quarantine Station for temporary duty.—**H. W. KEATLEY**, acting assistant surgeon, granted leave of absence for twenty days from January 20, 1906.—**W. L. STEARNS**, pharmacist, granted extension of leave of absence for seven days from January 20, 1906.

Resignation.—**J. B. GREENE**, passed assistant surgeon, resigned to take effect March 30, 1906.

CLINICAL NOTES AND CORRESPONDENCE

[Communications are invited for this Department. The Editor is not responsible for the views advanced by any contributor.]

QUARANTINE IN THE STATE OF ALABAMA.

BY

W. H. SANDERS, M.D.,
of Montgomery, Ala.

To the Editor of American Medicine:—My attention has quite recently been called to an editorial in your issue of November 25, last, headed, "Congressional Responsibility," in the course of which you criticise in severe terms both the public health system and work of Alabama, as of other Southern States. In this communication I shall not endeavor to do more than to speak for Alabama. Criticism is a legitimate and often useful weapon to be wielded in exposing weaknesses and correcting errors, but in order to fulfill these useful purposes two requirements are essential, namely, the critic must be possessed of full and accurate information in reference to the matter or thing criticised and his strictures must be logical and just. You will certainly not object if these tests be applied to the editorial.

To take up the points as they appear in the editorial I quote as follows: "Though commending the Chattanooga petition, as we most earnestly do, to the favorable consideration of Congress, we must protest that unconditional compliance would be the act of an over-indulgent and unwise parent."

In this sentence are you not guilty, Mr. Editor, of embodying a genealogical anachronism? Is the general government the parent or the child of the States? Did not the States create the general government, and if so does not the title of parent belong to them? The fact that thirty-two States have been admitted into the Union since the original thirteen created the general government does not alter the constitutional relations existing betwixt the States and the general government, the thirty-two as admitted assumed precisely the same relation toward the general government that the original thirteen sustained.

It would not have been worth while to call attention to this point in genealogy but for the fact that it involves an important principle in our governmental system, one intimately connected with any study or analysis of the quarantine function that may be undertaken. By keeping this principle clearly in mind, namely, that the States stand in the relation of parent to the general government, error and confusion in dealing with quarantine questions may be avoided.

I quote again from the editorial under discussion: "Congress should not assume the responsibilities offered by the Chattanooga memorialists without demanding equally vigorous exercise of rights reserved by the States. Of the fourteen States joining in this petition, some certainly, possibly a majority, are fit to profit by the release of all their quarantine powers to the United States; but three or four of the number show at this time no evidence of efficiency in sanitary self-government, and must be classed, not as contributors, but as beneficiaries in the amended practice of American public hygiene. These States lie about the very atrium of yellow fever invasion of the United States. They are Alabama, Mississippi, and Louisiana, and to give these States extraterritorial safeguards, without expecting them to construct internal defenses, would be to give something for nothing. The State Board of Health of Alabama is a mirage, a figment of medical imagination, believed in by its sponsors, but of little or no utility to the people of Alabama. In Mississippi the State Board of Health has a name to live, but is in reality dead. Mississippi is, however, not deluded as Alabama is."

I doubt whether editorial literature furnishes an instance in which fallacies so numerous and colossal were

ever crowded into a space corresponding with the above quotation, at least in so far as the quotation applies to Alabama. Alabama is singled out as one of the three or four States that "show at this time no evidence of efficiency in sanitary self-government." Let us see how this assertion accords with the facts of history. In 1878 a widespread and very fatal epidemic of yellow fever occurred in the South, several of the Southern States being extensively ravaged by the disease. Alabama contributed a little less than 300 cases to the 20,000 that occurred in that year, Mobile having been the only place in Alabama invaded. Why did Mobile furnish such a small quota of cases? Because for the first time perhaps in the history of outbreaks of yellow fever the Board of Health of Mobile contested the spread of the disease inch by inch. How? By thoroughly fumigating every house in which the disease appeared and spraying the premises with carbolic acid. While this was not done with the idea of destroying mosquitos, is it not obvious now how and why the vigorous policy pursued limited the number of cases that occurred in Mobile in that year to 300, or less? In the light of the mosquito doctrine of today was not this action of the Mobile Board of Health wise and prophetic? Did this work constitute "no evidence of efficiency in sanitary self-government"? In 1883 yellow fever was propagated from Pensacola to Brewton, in this State, a small town near the Florida line. The disease was promptly recognized and announced, thus affording an opportunity for protecting all other parts of the State from the disease, which was successfully done. Did the work of absolutely limiting the disease to Brewton not indicate some "sanitary efficiency"? In 1888 yellow fever was again propagated from Pensacola to Decatur, in this State. The disease was again promptly recognized and announced. So efficient was the sanitary work done that although Decatur was ravaged by the disease it did not spread to New Decatur, an adjoining town, the two towns in fact merging into one another. Did that work not entitle Alabama to some credit for "sanitary self-government"? In 1897, after yellow fever was discovered and announced at Ocean Springs, Miss., the fact developed that Mobile, Montgomery, Flomaton, and Greensboro had already been infected, but the disease was limited to these localities with the single exception that it was carried to Wagar, a small sawmill town. Neither did an extensive prevalence occur in any of the places infected. Did this indicate that Alabama was powerless for her own protection?

In 1898, although Louisiana and Mississippi on one side of Alabama and Florida on the other were more or less extensively invaded by yellow fever, Alabama protected herself absolutely, not having had a single case of the disease. In 1899 the same thing occurred with precisely the same result. In 1900 yellow fever appeared in several of the States adjacent to Alabama, but she successfully protected herself from the disease. Need I refer to the recent epidemic in order to furnish a conspicuous instance of Alabama's ability to protect herself? Although exposed on her sea front to the same sources of infection to which other Gulf Coast cities were exposed, and although wedged in betwixt Florida on the east and Mississippi and Louisiana on the west, in all of which yellow fever was prevailing, Alabama succeeded in defending herself, with the following exceptions: One case of fever reached Montgomery, was promptly diagnosed, announced, and isolated. No spread of the disease occurred. Two cases developed at Castleberry, a town not far removed from Pensacola. Vigorous measures were employed to prevent any spread from these cases and they proved successful. Many people look upon Alabama's success in defending herself during the recent epidemic as almost phenomenal, but it seems that you can find in it "no evidence of efficiency in sanitary self-government."

Not only did Alabama protect herself during the

recent outbreak, but did it without imposing any restrictions whatever upon commerce, her merchants and public carriers having enjoyed throughout the quarantine season a degree of prosperity unsurpassed, if ever equaled, for the corresponding time in any previous year.

To sum up: In the past 35 years Alabama has not one single time permitted yellow fever to be imported into the country through her seaport. During that period she has been infected four times, the infection having been received overland from some of her neighboring States. In three of the four years in which she became infected, the outbreak was confined to a single locality, and in the other year it was confined to five localities, in neither one of which did the disease prevail extensively. For the period stated, the past 35 years, the total number of cases of yellow fever that have occurred in Alabama would not much, if at all, exceed 2,000. Did time permit the exact figures would be furnished. Does this record justify, Mr. Editor, the severe condemnation of Alabama's sanitary work you have pronounced, and the *ex cathedra* style in which you have done it? Does it not show that you have assumed a position that is wholly untenable? If so, should you not be magnanimous enough to withdraw the severe allegations you have made against our sanitary efficiency?

Further, you charge, Mr. Editor, that Alabama, Mississippi, and Louisiana "lie about the very atrium of yellow fever invasion of the United States." Let us compare Philadelphia and Mobile as atria for yellow fever and see what will be developed. The records show that Philadelphia has been the "atrium" 13 times and very probably the "atrium" three other times. Mobile is known to have been the atrium three times and may have been the atrium on two other occasions. Philadelphia easily carries off the honors in this comparison. Alabama has not permitted yellow fever to find ingress through her port since 1870. With this record can you consistently point to Alabama and charge her with habitually being an importer of yellow fever?

Alabama has abundantly demonstrated her ability to defend herself against both foreign and domestic infection, and is not a beggar at the door of the general government to give her "something for nothing." She has constructed and successfully operated both her "internal" and external defenses as her records show, and had other States done as well not a case of yellow fever would have landed upon our shores for the past 35 years. All Alabama asks is that some constitutional and efficient provision be made to prevent a weak link in our chain of coast defenses. She is able to meet and manage domestic infection, has done so in the past, and proposes to do so in the future.

We here in Alabama, who are on the ground, believe that four times in the past seven years the State has been imminently threatened by an invasion of yellow fever, with all that such a disaster means—sickness, death, panic, demoralization; social, commercial, and industrial disorder, and paralysis, and we further believe that the work of the State Board of Health has averted the peril and protected the people. Perhaps we are laboring under a delusion, but in spite of the opinion of an editor 1,000 miles away to the contrary, I think our people will continue to hug the delusion.

I fear you have never read, Mr. Editor, the constitution of the Board of Health of Alabama and our public health and quarantine laws, and beg to commend the former to you as a document worthy of study, based as it is upon philosophical principles and logically put together from foundation to dome. Our public health system we regard as ideal under our form of government. If this be a delusion we can say that it has received the warm endorsement of many of our neighbors, both near and distant. I feel safe in challenging you to inquire of our nearest neighbors, those who have had the best opportunities of judging, as to the efficiency of our sanitary and quarantine work.

Our public health system is one thing and the legislation necessary to carry it out in all of its details is another thing. The former is and must be the work of medical men; the latter is and must be the work of law-makers. Under the evolutionary process that is going on, the people, including the lawmakers, are being educated as to the necessity for a public health system; naturally, therefore, we expect in the near future to secure all of the legislation we need in order to make the system bear all the fruit of which it is capable.

Your editorial closes, Mr. Editor, with a complaint that the three States, Alabama one of them, against which you seem to harbor an animus, sent out a "tide of smallpox which spread to all parts of the United States between 1897 and 1903." If the health systems of other States are not a mirage, as Alabama's seems in your judgment to be, why was not this tide of smallpox met at the border and turned back? Why was smallpox permitted on one notable occasion to ravage your own city with terrible fury and fatality, inflicting it with not only a large loss of life, but with financial disaster that went into the millions? Alabama pleads guilty of having had a very considerable prevalence of smallpox in many of her counties since 1897, but her Board of Health can in no wise be held responsible for this prevalence. Had our legislators given us the laws we pleaded for the outbreak could have been extinguished at any time within 90 days or less. In many of the counties vigorous and efficient work was done, and in every such instance the disease was promptly controlled. In counties where less vigorous work was done the disease gained considerable prevalence. In the last analysis the condition that accounts for the smallpox we have had in Alabama is the presence of our negro population. They are now free to come and go as they please and to have and to harbor smallpox to their heart's content, often concealing its existence, as they do, until it acquires very considerable momentum. When the negroes were slaves such a prevalence was impossible. In those times smallpox occasionally reached a plantation, but isolation was rigidly enforced and the disease did not travel to adjoining plantations. Not more than 5%, if so much, of the smallpox we have had in Alabama has been among whites. Without our negro population no such prevalence of smallpox as has occurred would have been possible. In your State and in other northern States no such difficulty existed, and yet you admit, and we see by official reports, that you have had a wide prevalence of the disease. If your Boards of Health are not "figments of medical imagination," why did they permit the infection of smallpox to spread so extensively, even although a few cases of the disease were introduced?

You call attention, Mr. Editor, to the tax we annually impose "on human energy by typhoid fever, malaria, uncinariasis, pneumonia, and tuberculosis." Does your State pay no such tax? Alabama will willingly compare records with Pennsylvania upon all of the diseases mentioned save two, and would confidently expect to emerge from the comparison with flying colors.

This review of your editorial has grown to much greater length than I wished, but justice to my State did not permit me to say less. I beg to extend you a cordial invitation to attend the next annual meeting of our State Board of Health, which will be held in Birmingham in April next, and if after studying our system fairly and without prejudice you should adhere to your present opinions, I will make no complaint.

New Physician for Jersey Convicts.—Charles Brewer has retired as house physician at the State Prison, and in honor of the event the officers of the institution gave him a handsome silver tea service. He is succeeded by Dr. S. S. Stanger, of Salem County, formerly president of the Board of Prison Inspectors.

ORIGINAL ARTICLES

THE READJUSTMENT OF EDUCATION AND RESEARCH IN HYGIENE AND SANITATION.¹

BY

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In Herbert Spencer's well known definition, continuous adjustment is seized upon as the essential characteristic of life, and in any vital enterprise such as business, government, education or research, frequent, if not continuous, adjustments and readjustments are indispensable. In the present paper I propose to inquire whether the time has not come for a readjustment of our definitions and methods of research and education in hygiene and sanitation. And if it turns out, as I think it will, that such is the case, I shall venture to indicate some of the steps required to be taken in order to bring about readjustment.

We shall gain in perspective more than we lose in time if we recall briefly how the conditions that now prevail originated. In doing this we need not go further back than Pettenkofer, for with him, his associates and successors, scientific hygiene and sanitation as these exist today began. It is true that the Greeks valued the *mens sana in corpore sano* and earnestly strove to attain it. It is true that Combe and Kingsley and many other English laymen did good public service in the middle of the nineteenth century by preaching that cleanliness, public as well as private, is next to godliness. It is true that Johannes Muller and his successors laid the basis of a rational personal hygiene by working out the basis of a rational physiology. But the first to bring to bear upon hygiene in all its branches, so far as then known, the exact methods of chemistry, physics and physiology; the first to emphasize adequately the importance of good water supplies and especially of good sewerage; the first to examine scientifically the ground, and ground air, and ground water, the porosity of the walls of houses and, in general, those environmental aspects of hygiene to which we give today the special name "sanitation,"—was Max von Pettenkofer, Professor in the University of Munich, with his associates and successors.

In recognition of Pettenkofer's pioneer work and the importance of the science which it represents, a new institute, the Hygienic Institute, of which Pettenkofer was made the Director, was added to those already existing in the University of Munich and this building, located near the Physiological Institute and like that situated upon a street which now bears the name of Pettenkofer, should be a shrine of pilgrimage for all hygienists both as Pettenkofer's laboratory and as the first of a long series of hygienic institutes established since then

all over the civilized world. Up to this time Pettenkofer had worked in the Physiological Institute with his friend and colleague Voit, so that the new science of Hygiene may be said to have sprung directly as a branch from Physiology, then as now, a fundamental member of the group of medical sciences. The connection of hygiene with medicine, or at least with physiology, is thus ancestral and phylogenetic. But while hygiene began, and must always begin, with physiology, it did not and cannot end there. Pettenkofer's own work even, soon led him into questions of public hygiene, involving, for example, chemistry, physics and engineering, into air analysis, soil physics and problems of water supply and sewerage. And so urgent and promising were these problems of the public health that the physiological problems of individual or personal hygiene soon played but a small part in the work of the new Institute.

This tendency to depart from physiology, thus early discoverable in this first hygienic institute, was a recognition—perhaps an unconscious recognition—of a fact which has since become perfectly clear, namely, that the sphere of hygiene is naturally separable into two distinct hemispheres, one dealing directly and chiefly with individuals or masses of individuals, the other directly and chiefly with their environment. And inasmuch as it is this tendency and this differentiation which have, as it were, thrown out of adjustment our earlier methods of research and education in hygiene, making necessary that readjustment which it is the purpose of this paper to propose and promote, we must before going further observe carefully how far this differentiation has proceeded already, and how far it is likely to go in the future.

If we examine any recent textbook professing to cover the whole field of hygiene we cannot fail to be struck with the variety, not to say incongruity, of the topics treated. This is especially true of the German textbooks, taken as a whole, but is also characteristic of some English and American textbooks. Subjects as unlike as muscular exercise and street cleaning, or foods and railway sanitation, are grouped together, so that the reader who turns the pages cannot help wondering if hygiene is not the most comprehensive of sciences and a hygienist the broadest of men. Moreover a student of the science of health soon meets the words "sanitary" and "sanitation" as well as "hygienic" and "hygiene" and may well ask exactly what each and all mean. If he be interested in research rather than education he will meet not only with hygienic institutes, but also sewage experiment stations, food and drug laboratories, and laboratories of sanitary research; and laboratories of sanitary chemistry, water analysis, food analysis, etc. These various differentiations are largely the outcome of the marvelous additions to our knowledge, and especially to our knowledge of the environment, within the last half century. Almost every discovery in science, almost every

¹ Read before the American Public Health Association, at its thirty-third annual meeting, held in Boston, Mass., September 25-29, 1905.

advance in engineering, has contributed some fact or condition of practical interest or importance to general hygiene. The pressure of population, the migration from country to city, labor-saving machinery, the growth of traveling, the enrichment of our dietaries, the factory system, high buildings, cold storage, and a thousand other modifications of our ways of living,—all these have opened up problems of hygiene previously either non-existent or unknown. Today we are also beginning to appreciate, as never before, the importance and power of the protoplasmic human mechanism which has to struggle for existence and success under these various conditions, and to look to the physiologists for a more intimate knowledge of its normal operation.

Meantime, in America at least, research in hygiene is comparatively sporadic if not desultory, and educational opportunities in hygiene are few and unsatisfactory. Hygiene is allowed only a modicum of time in our medical schools and little or no place in many schools of engineering. And yet its importance to modern society is unquestioned. Never before has a higher value been set upon the working efficiency of the human machine. Never before have preventive medicine, hygiene, or sanitation occupied so high a place in the public esteem. Why is it, then, we may well ask, that medical schools pay so little attention to a subject so important, and at the same time so closely connected historically and practically with medical science? The answer to this question will, I believe, establish the truth of my thesis that readjustment is required, and will also reveal some of the steps required to bring about such readjustment.

In spite of its admitted importance, hygiene still occupies only a very small place in our medical schools, partly, I believe, because *sanitation* has become so large a part of hygiene, and *sanitation belongs in schools of engineering*; and partly because for medical men there are, in our country, very few attractive positions in the applications of hygiene. Let us consider the first point more carefully. It is today absurd for the average well trained medical student to think of becoming an expert in such branches of hygiene as water supply, sewerage, heating and ventilation, street building, cleaning and watering, garbage collection and disposal, gas and other forms of light supply, ice supply, milk supply, the abatement of nuisances, etc. These belong rather to the sanitary engineer, sanitary chemist and sanitary biologist; to sanitation rather than hygiene.

Closer to the physician's own work, and yet almost a science in themselves, are the problems of personal hygiene,—muscular exercise, sleep, foods and feeding, bathing, clothing, mental work, and the like. Half way between personal and public hygiene, lie such subjects as school hygiene and school sanitation, epidemiology, quarantine, the control of foods and drugs. If the modern medical student can find time for a thorough ac-

quaintance with bacteriology and serum science he is probably doing all that we ought to expect of a well trained beginner in medicine or surgery. The difficulty here described suggests its own remedy. Why not begin our readjustment by making a sharp distinction between the hygiene of the individual and that of the environment, keeping for the former the older, broader and historic term *hygiene*, and giving to the latter the term already almost universally applied to it (unless in Germany), namely *sanitation*. Next, why not frankly give up the pretense of teaching in medical schools of more than the most general and elementary principles of water supply, sewerage, heating and ventilation, street construction, street cleaning, street watering, plumbing, gas supply, ice supply, milk supply, and the purity of foods and drugs, leaving these to sanitarians—engineers, chemists, and biologists. Freed from such subjects, courses in hygiene might be given in medical schools which should be practically valuable to medical men, dealing as these should chiefly with its personal aspects, and yet involving some of the most important matters relating to the public health. Such courses would be essentially medical, or at least physiological, and are today greatly needed. I think I am within the truth in saying that in some engineering schools sanitation is today better taught than personal hygiene is in any medical school; and this surely ought not to be, and need not be, true.

As for research, it is idle to expect the ordinary medical man to be greatly interested in or to spend much time upon the detailed problems of water or sewage purification, even if he has—as he generally has not—the requisite training. We must expect this work to be done by engineers, chemists, and biologists, and not by physicians. And its teaching belongs in schools of science and engineering rather than in medical schools.

At the same time another and fundamental readjustment is sorely needed, which, if it could be effected, would do more to promote good teaching and research in hygiene and sanitation than any other one thing. This is the establishment of *permanent, well-paid positions* in the service of the public health. I am not sanguine that this readjustment—the most fundamental of all, and one which, if it could be made, would speedily bring about the others—is either easy or imminent, and yet I believe that we should never cease for an instant to proclaim its necessity or to work for it. Somehow or other, we must in America secure a large group of well-paid public health officers who shall have powers of more than local jurisdiction, or at least more than local visitation, criticism and advice; who shall be supplied with laboratories and other means of experiment and investigation; and who shall be able and willing to call to their aid and co-operation, sanitary engineers, sanitary chemists and sanitary biologists. These public health officers will naturally be medical men, but they will not be ordinary

medical men. They must be specially trained for the work; they must know more of infectious than of chronic diseases; more of medicine than of surgery; they must be thoroughly equipped in epidemiology, and must have a general but sound elementary knowledge of sanitation; they should know and use statistics; and above all they should possess tact, courage and firmness. When the places for such men are provided the men will soon be found. And medical schools will then gladly give courses, not only in hygiene but in public health, such as will prepare good candidates. I believe it to be our first duty to work for the establishment of such public health positions, and all that is needed to secure them is a general readiness to surrender some local pride and some local importance, for the sake of national progress, mutual benefit, and the advancement of science.

Meantime we must look to our universities and technical schools for the maintenance of the very best hygienic laboratories and sanitary experiment stations which they can afford, and to our states and cities for the best that money can buy. Even these are not enough. Brief but comprehensive courses in the theory and practice of hygiene, and especially personal hygiene, should be offered in all medical schools, and in the theory and practice of sanitation, in all technical and scientific schools. In this way the road would be open to all—physicians, scientists and engineers—to become grounded in the general principles of hygiene, while for those whose tastes and abilities led them to go further, the research laboratories already mentioned, and the positions described would offer an incentive, holding out inviting and honorable careers. It is hard to think of any consummation at present more devoutly to be wished for in the United States, or more certain to redound to the promotion of the public health and the public welfare.

Politics must also be wholly eliminated from our boards of health, both state and municipal. There is no republican method of vaccination, no democratic plan of street cleaning. And places on boards of health must not be used as rewards of political activity. The time,—if it ever existed,—has gone by when a proper board of health can be made up of a political doctor, a political saloon-keeper and a political nobody; for no well-trained and self-respecting expert in hygiene or sanitation can or will remain in the dubious and uncertain service of such weak, incompetent or shifty characters.

A County of Casualties.—More men are killed and maimed in Allegheny county in peaceful pursuits in a year than are killed and wounded in great battles. Statistics for the past year show that there were killed and injured in the iron and steel mills and blast furnaces 2,000. In other mills, shops, and factories, 4,000 either died or were maimed, while the coal mines swell this figure to 4,000 more, and the railroad victims include an additional 400, making up a grand total of 17,400 who were killed or injured in a year. In addition to this number, it is said, there are many cases that are not reported.

THE PROBLEM OF PSYCHIATRY IN THE FUNCTIONAL PSYCHOSES.*

BY

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In the study of mental diseases it is important to find their true place in relation to other pathologic conditions. Our conceptions of the nature of mental symptoms should be framed in harmony with the true principles of general pathology. These are essential requisites for the progress of psychiatry. I shall try to present some considerations to this end in discussing my subject: "The problem of psychiatry in the functional psychoses."

It is essential here, as in all such inquiries, to have a clear understanding of the terms of the problem; words and phrases, and the formulas of principles, should have correct and definite meanings. Our ideas may be embodied at first in words which seem to express exactly all that we know; but as our conceptions tend to outgrow their verbal expressions these may gain the larger import and lose the narrowness of their derivations; or being used in an earlier and more or less restricted sense they hamper thinking in the shackles of authoritative phrases that obstruct reasoning, and single words may perpetuate error and lead to confusion of interpretation and discussion. The dictums of general principles accepted as fundamental may sometimes harbor hidden fallacies and prove to be untrue after having long retarded progress. It is a necessary part of this discussion to examine first some definitions and the formulas of certain accepted principles and the doctrines drawn from them.

The terms in which the present subject is expressed contain no ambiguity as to its meaning to lay down the proposition that the problem of psychiatry is to be found in the functional psychoses, meaning here mental diseases. But something needs to be said defining the true province of psychiatry; and the words "functional psychoses" lead at once into the maze of difficulty surrounding the relations of functional and organic diseases. In the definition of disease, as "any morbid deviation from normal health," "the important distinction is drawn between organic or structural diseases in which there is a lesion or pathologic condition of some part of the body, and functional diseases in which there is an irregular action of a part but without organic abnormality." But keeping to this distinction, it is a remarkable fact that the word "psychosis" is used in opposing senses in mental physiology and mental pathology. The psychologists, having regard to the normal processes, use "psychosis" as "equivalent to the mental or psychic element in a psychophysical process, just as neurosis refers to that aspect of the process which belongs to the nervous system." On the other hand, in psychiatry the word "psychosis" is used pathologically and "desig-

* "To fill the vacancy in the program created by the absence of one of the principal speakers, this address was presented by Dr. Edward Cowles, Chairman of the Section of Psychiatry of the International Congress of Arts and Sciences, St. Louis, September, 1904, and subsequently revised by him from the outline then given.—Editors *American Journal of Insanity*." Published synchronously with the *Boston Medical and Surgical Journal*, by courtesy of the Editor.

nates an abnormal mental condition"; it is described as a typical form of insanity ("disease-form") which can be scientifically differentiated and correlated with a specific "disease-process," and the usage implies a structural change. In neurology "neurosis" is also changed from its normal functional sense in psychology and used to designate a "morbid or diseased condition." "Functional neurosis is a morbid affection of the nervous system known only by its symptoms, and without anatomic basis. It is doubtless true that an anatomic lesion of some kind does in each case exist, and the classification of diseases as organic and functional is but a concession to our ignorance."¹ These instances afford examples of looseness of usage in two most closely interdependent lines of research showing the disharmony between them that tends to confusion of understanding. It is allowable to speak of the neuroses, and the meaning is plain as referring quite exclusively to functional disorders; but to constitute a true psychosis, in the pathologic sense, it must have a definitely differentiated symptom-complex that can be designated as a "disease-form"; this is commonly spoken of as a clinical "entity," and it implies a correlated "disease-process." We may speak of acute and chronic psychoses, or of organic psychoses, to distinguish the insanity due to cerebral disease. But the psychoses proper being conceived as real disease-entities, when in psychiatry we wish to speak of the group of minor and often temporary variations of the mental functions, parallel or corresponding to the neuroses in neurology, the word functional must be added and the term functional psychoses used as in the subject of this discussion.

POSITION OF PSYCHIATRY AS SHOWN BY CURRENT TEACHINGS.

The point of view of this inquiry is that of general medicine for one who, without predilection and looking for light on all sides, approaches the field of psychiatry and tries to understand its problems. In seeking the true place of mental diseases in relation to other pathologic conditions, and in order to harmonize his conceptions with the true principles of general pathology, it is found at the outset that the functional psychoses are to be regarded as being in contrast with the psychoses proper associated with assumed structural changes and "disease-processes," or with definite organic diseases of the brain. Here, as in general medicine, this distinction of functional and organic disease appears to be an expression of the dominance of morphologic conceptions in medical knowledge. Diseases due to obvious structural changes can be understood and subjected to treatment as in surgery; but the bodily diseases called functional, for which there is no pathologic anatomy, constitute a very large group.

Although there is a greater reason for this being true also of functional mental diseases, the inquirer finds in the psychiatry of the time small interest in them. It is a very old idea that the different forms of insanity may be explained by the study of the brain and its degenerations. The history of modern psychiatry shows that it has given great emphasis to these morphologic conceptions by its precise methods and achievements in histo-

logic investigations of the brain. In recent years the German schools have been the centers of interest. The environment of their origin had preeminently the morphologic stamp. Thus the effort to determine definite "disease-forms" and "disease-processes" has been a distinctive characteristic of modern teachings in the search for anatomic correlations and explanations. The application of the scientific method in clinical study has been most fruitful of admirable results. The "disease-process" assumption has been stimulating and helpful as a spur to morphologic investigation, which all agree should be carried to the utmost. But with the inheritance of such conceptions the modern movement has been characterized also by the continuance of the quest for mature forms and types and for their systematic classification. The pathologic principles being embodied in the designations "disease-form" and "entity," and "disease-process," the consistent use of these has implied that every such pathologic process should have its cause, course, and outcome. A psychosis thus constituted is held to present the attributes of scientific truth, although some actual morphologic characters that furnish complete and proper proof may yet be wanting.

While these teachings have been taking form in the last 20 years, the influence of modern psychology has been felt and is becoming apparent, especially in the last half decade. Although psychologic studies of mental functions are viewed with no less distrust than before, the experimental method, in its clinical use in psychiatry, excites interest by the objective character of its results; they have the value of observed and measurable facts of function which may contain the promise of being ultimately traceable to facts of structure.

The present results of this movement are exceedingly interesting and promising, although it is true that there is much diversity in the products of these methods of study. With the increasing number of observers, the more variations there appear to be in the interpretation of the phenomena. This is shown in the differentiation of named "disease-forms," and by a comparative study of some new classifications.² This, however, is a hopeful stage of progress. In the extreme view it has been held to be unreasonable that any conclusions can be drawn from the psychic activity of a diseased brain; psychologic explanation is of no value, it is said, without an objective measure in definite "disease-processes" in the cortex. According to other views, in which the conception of a "disease-process" is still fundamental, conditions that do not lead to deterioration are conceived to be of a "special type," and a "biologic entity" is conjectured as representing "a special kind of disease-process or disease-principle." Again under broader conceptions it is held that more than one point of view is needed to do justice to psychiatry, and a special psychopathology is founded upon normal psychology. But this meets criticism as giving undue prominence to psychologic distinctions inconsistent with a true medical conception of disease.

The influence of the new German schools has been strongly felt in other countries. But the inquirer, extending his survey in these directions, finds that the

cotemporary interest in the physiologic aspects of psychiatric problems has not waned, though they are somewhat overshadowed. In Italy, for example, Ferrari has studied the pathology of the emotions, as has Féré in France, where Ribot has done the most to elucidate the relation of mental experience to the personality, and Janet has made his remarkable contributions to future psychiatry by the analysis of mental instability in the borderland of insanity. The British alienists have conservatively given attention to functional as well as to anatomic conceptions, notably Mercier. Hughlings Jackson has magnified his distinction as a neurologist by his recognition of the importance of the physiologic factors in nervous and mental disease; his method of reasoning from functional characteristics to interpret structure, instead of inferring function through proofs in structure, is now attracting renewed interest.

These English views have long held a like formative place in America where they have not lost, but have sustained their force during the decade since the introduction of German teachings. Attention was first attracted especially to Kraepelin and his methods at the Heidelberg clinic with a consequent intensification of interest in morphologic conceptions qualified by clinical observation. The painstaking studies of Meyer and Hoch approached the subject from the neurologic side loyal to the scientific method; through their work the conceptions of Kraepelin were submitted to the tests of practical cooperative study and experience with results anticipating his own later simplifications of "disease-forms." There was also, not only the establishment of collections of admirable clinical records, valuable for further study and analysis in future, at the McLean Hospital and the Worcester Insane Hospital, where the special work began, but the extension of this clinical method to many other hospitals. Later in the movement came the different interpretations of psychiatric problems by Wernicke and Ziehen—the latter with an especially hopeful attitude toward psychologic explanations. There has appeared a tendency to change in the views of these German teachers, of whom it is said they "have emancipated psychiatry from the peculiar position of an adjunct to neurology"—a position for which the claim has long been made and is not yet yielded.

In the outcome of the decade in America the intensity of the new teachings is being qualified by independent studies of the problems involved, and the continuity of the current of earlier views here has been maintained. This former trend has persisted not only in psychiatry but it has appeared in neurology which was formed in, and has held to, pronounced morphologic conceptions. Dana, Putnam, and Prince, for example, have taken special interest in the physiologic and abnormal aspects of mental phenomena. Herter has made the most noteworthy of contributions to the future understanding of mental as well as nervous diseases, by studies of the chemistry of pathologic physiology and the disorders of nutrition and metabolism in seeking the fundamental principles of practical therapy. Traceable here, as in general medicine, is the influence of the immensely important work of Chittenden; while this has little or no place in German teachings of neurology and psychiatry,

the chemic side of the composition and activity of nervous tissues is receiving attention in England, in recent years, through the special studies of Mott and Halliburton which, however, relates distinctly to changes in structural disease. In America, the trend toward functional conceptions of mental pathology became embodied, with a special motive inspiration from general medicine, in the work of the McLean Hospital more than two decades ago. Early in this period, under the added influence of the new teachings of physiologic chemistry, the purpose was developed which has led, in the last half decade, to Folin's chemic investigations of disordered metabolism in immediate connection with the clinical study of the physical conditions and treatment of the insane; the parallel development, on both physical and mental lines, of the original purpose there is also finding its prime expression in the recent establishment of another clinical laboratory in which Franz is applying the physiologic and experimental methods of the trained physiologist and psychologist. This particular development of the tendency to studies of the physiologic aspects of psychiatry has been characterized throughout by its essential purpose of seeking guides for treatment of the physical conditions associated with functional mental disorders.

It appears that the turning away from the barrenness of histologic provings is becoming general; the improvements of the clinical method and psychologic experiment are inevitably drawing attention to the closer observation of the individual patient, and to the better study of the minor causes of his mental variations; this means a trend toward physiology. It is a safe prediction that pathologic physiology is to be called to render such aid to psychiatry as it is giving in general medicine, and that the extraordinary advances in pathologic chemistry will become available in mental diseases.

Such are some of the considerations suggested by a survey of the present aspects of the field of psychiatry. The changing attitude of psychiatry toward psychology is of great significance. These circumstances guide the inquiry into the conditions and causes of the present position of psychiatry.

RELATION OF PSYCHIATRY TO GENERAL MEDICINE.

Psychiatry belongs to general medicine.³ This view has been presented in the annual reports of the McLean Hospital since 1882; my first statement of it, in the report of that year, was to the effect that the physiologic basis of the treatment of the insane lies in the fact that the normal functions of the cerebral organ may be only temporarily disturbed or only partially impaired, whether by transient disorder or pathologic change; and the consequent fact that, in most cases, some degree of normal function remains. This principle was stated to be in accordance with the most important gain of modern pathology, the modern conception that "disease is, for the most part, normal function acting under abnormal conditions."⁵

Mental diseases, in their study and treatment, include more than is contained within one branch or department of general medicine by having to deal with the mental effects of pathologic conditions of the whole body; psy-

chiatry is not limited especially to the nervous system with its central organ, which has functions of a wholly different and higher nature than those of any other organ. There are functions of the brain other than the common ones of receiving impressions and reacting uniformly upon them like a reflex mechanism; by its mental function it receives impressions, retains and recalls its conscious experiences, selects from and rearranges them, and in new and orderly forms initiates and controls the processes of motor expression. The psychiatrist, newly attempting the precise study of mental symptoms, is confronted at the outset with the oldest of problems, the relation of mind and body. If he turns to physiology and neurology for light upon the physiologic terms, mental and physical, of his problems he meets everywhere such statements as that of Wundt: "In matters psychologic the naturalist can only affirm that psychologic phenomena run parallel with physiologic facts, but that on account of their different natures he has no prospect of ever bridging the gulf between the two." Edinger⁶ writes: "We have no idea how it happens that a part of the work done by the nervous system leads to consciousness." Lloyd Morgan⁷ offers the following practical conclusion: "One of the difficulties is that of conceiving how mind can act on matter, or matter on mind. . . . Let us at once confess our ignorance of the nature of the intimate relation of the one to the other. But certainly in many cases the observed facts show that our ignorance notwithstanding, they *are* somehow related. . . . And since we cannot know the nature of the relationship, let us be content to seek for some of its conditions."

The psychiatrist is a physician who should take his point of view in a field even broader than that of general medicine in its largest sense, and not within the narrow limits of any specialism which may seem to include the sphere of mental activities. He has to deal with the physical effects upon the individual of all the influences that act upon him in his environment, and that enter into him from without, or are engendered within, which make for the maintenance or impairment of his vital processes. Such physical influences contributing to conscious experience have their mental effects; the psychiatrist must not only seek to understand the physical changes and effects, but he must deal with the patient's consciousness of them, and the more subtle influences that affect the subconscious mental life. The physician must study not alone the influence, upon the mind, of the body in health and disease, but also the external physical, social, and moral conditions of the environment unfavorable to mental health and growth. It is in association with this broader view of general medicine that, with respect to mental disorder, he must seek explanation on the physical side of the organism, and turn to expert research for such aid as can be given him by the contributing sciences.

The field of the medical sciences is as wide as that of biology, which comprehends all the interdependent phenomena of mental and physical life; the abnormal must be referred to the normal. The first recourse of the psychiatrist is to physiology, of which the domain is the study of the forces or functions of living matter. There

are no symptoms until there are deviations from normal function; without functional activity disease is impossible.⁸ On the side of normal life, living substance necessarily presents the conditions of structure, form, and function; these conditions are primary and disease is not necessary to the existence of living substance. Here the general physician finds himself involved in the contention between the sciences of physiology and pathology; the psychiatrist needs first a normal standard in his knowledge of general physiology, and all that he can learn of mental physiology and its relations to its mechanism, structure, and form. Psychology lays open to intimate study the facts of the mental life; on the anatomic side we can know little, and that little explains nothing of the relations between mind and body. It is at this point that the physician must choose his point of view and form his conceptions of fundamental principles. If these are true they should fit all discovered facts, whether of function or structure, and will lead to advancement of his knowledge; if not true they lead to conflict and confusion, and obstruct progress. It is necessary to examine the mutual relations of the biologic sciences to know their relative value to psychiatry.

POSITION OF PATHOLOGY AND ITS INFLUENCE UPON MODERN PSYCHIATRY.

The science of pathology, with the justification of its brilliant achievements, holds itself to be fundamental to the medical sciences. Its elucidation of the phenomena of disease and its results puts it into inseparable relation with life. It claims that its conceptions comprehend all of biology, for on all sides it bears essential relations to the subsidiary biologic sciences. Deviations from normal structure and composition of the body, and from the normal functions of its parts, are held to belong to pathology; in this view the study of structural variations in the evolutionary and the developmental processes, from the normal in primordial and embryonal forms, may explain inherited and congenital disease, and, as a part of pathology, throw light upon morphology. Physics and chemistry, as they underlie both function and structure, contribute to the explanation of pathologic change and the disorders of function caused by disease; and pathologic physiology and chemistry, the importance of which is now receiving growing recognition, are to be regarded as subsidiary to pathology and dependent upon it. In the sphere of general pathology, dealing with function, it finds its duty to be "to correlate symptoms with structural changes and trace the connection between them."

The science of pathology, presenting by its salient aspects such claims to the physician who seeks for light upon the problems of psychiatry, reveals a changing history. The leadership of the pathologic-anatomic school in France passing over to Germany culminated in the "cellular pathology" of Virchow, this being founded upon the principle that the cell is the unit of structure and function, and that all vital processes are to be referred to the activity of the cells of which the body is composed; they are the "factors of existence." This includes the phenomena of disease and all alterations of the organs and tissues, the principle being that whatever acts upon the cell from without, produces a change,

either chemic or physical, in the cell structure, and disease is constituted of such changes. These principles became the foundation of the "exact medicine" of the present day. Griesinger first established modern psychiatry upon the exact basis of scientific research and pathologic principles, and through Meynert pathologic-anatomic teachings were greatly advanced; following them, it was in such an environment that the latest schools of psychiatry had their beginnings with the immediate inheritance of its morphologic conceptions as the fundamental criterions of scientific truth. Such were the conditions of the inception of the current teachings, based upon a rigid morphology. The German schools of psychiatry became the centers of interest and influence, and their characteristics have already been noted. In the history of the time from Virchow, Griesinger, and Meynert, to the present, there have been momentous advances in the other biologic sciences, as well as in pathology and psychiatry. The two latter lines of research are being strongly influenced by the concurrent changes. There are some very recent and significant signs of changing views in psychiatry, which possibly betoken the freeing of itself from the too rigid dominance of structural pathology.

RELATION OF PATHOLOGY TO OTHER BIOLOGIC SCIENCES, ESPECIALLY TO PHYSIOLOGY.

Physiology, when it declared itself an independent science by breaking away from medicine and establishing its place in the great realm of biology, entered upon a broader field of study of the functional side of life with its complex phenomena in the functions of all living matter. To morphology, as an equally independent science, belongs the study of the structure and form of living matter; it covers the whole field of anatomy in the special forms of zoology and botany. But physiology and morphology, which are closely woven together, are both built upon the foundation of the inorganic elements of inanimate matter with its controlling laws of physics and chemistry that govern the forces of inanimate phenomena. All these forces of animate and inanimate nature are bound together; from a biologic point of view we do not know living matter without both form and function.

On the part of the physician the inquiry at this point is as to the true relations of pathology to the other biologic sciences in medicine. The scientific foundation of pathology, the development of its work in the other sciences which it necessarily involves, support its claim to an equal place in biology with the other natural sciences.

Professor Orth, in an address at Kassel in 1903, described pathology as consisting of two branches, anatomy and physiology. Although the great Virchow remained a pure pathologic anatomist, he contemplated the beginning of pathologic physiology as the culmination of his endeavors; "one of his favorite themes was the establishment of pathologic physiology, a subject which, to his mind, was the foundation of scientific medicine, and therefore of medicine as a whole." Practical medicine, according to Virchow, is coextensive with pathologic physiology; this is founded on pathologic anatomy, clin-

ical observations, experimental researches; its problem is the determination and investigation of bodily processes under abnormal conditions, of illness and its symptoms. Virchow's experimental investigations to clear up morphologic characteristics of disease go only to the beginning, and Professor Orth urged that better attention should be given to physiologic methods for the determination and interpretation of functional disorders in the unhealthy organ; yet pathologic morphology must remain the unchangeable groundwork of all medical knowledge and thought; its most important function is its purpose for the upbuilding of pathologic physiology, for the understanding of the living processes and their disturbances in the sick body.

Bacteriology in its marvelous progress leads investigation directly into the field of pathologic physiology, and finds explanations in the normal physical and chemic reactions that belong to the normal cell physiology. Pathology, taking bacteriology into its special province, is engaged in the study of problems relating to the nature of disease. General physiology has shown that the physicochemic reactions in living substances are fundamental and essential factors in the production of vital phenomena; it finds in its investigation of the component elements of cell substance that in physiologic chemistry is its chief aid in the explanation of vital activity and its disorders. Herter⁹ reviews our present knowledge of the chemic defenses of the organism against disease; it serves to emphasize the varied chemic activities of the cells and to render more intelligible the phenomena of diseases that result from modifications or failure of these cellular functions. He says: "Modern pathology has made us familiar with the conception that disease is generally the expression of a reaction on the part of the cell to injurious influences. The only rational conception of the ability of the human body to defend itself against disease by means of chemic agencies is that these defenses ultimately reside in the cells themselves.

Many of the phenomena of disease are caused by the modification of function that occurs during the action of the cell in resisting injurious influences. Ernst¹⁰ has shown that notwithstanding the great obscurity of the subject and the somewhat conflicting theories, the point is maintained that in all reactions the cell activity intervenes at some stage of the production of immunity; and that most probably the reactions that occur are closely related to these that go on under the ordinary conditions of tissue metabolism. These conditions are consistent with the fundamental doctrine of cell physiology and pathology.

It appears from a brief survey of the history of pathology that when at first it was a part of anatomy, it was then preeminently morphologic, and that this characteristic motive still prevails to a large degree. After it became independent, pathology concerned itself especially with deviations from the normal anatomic standard. It developed new relations with the other biologic sciences as they attained existence, and like morphologic problems arose in connection with them. There was mutual receiving and giving of aid, but anatomy was the parent science, and the study of the concrete facts of

structure being easier than ever-changing function, morphologic conceptions have always kept in advance, and pathology has held them to be essential in giving finality to its explanation and proofs. But, with the slowing of progress, as normal and pathologic histology has approached the frontiers of present attainable knowledge, much of speculative theory has arisen in the endeavor to prove apparent and conjectural realities of structure by reference to the facts of physiologic activity. The history of pathology reveals evidence in support of the conclusion that, from the beginning, the science of pathology has needed first the data of normal form and function in order to study their deviations; also pathology has been steadily tending to the finding of its ultimate dependence upon physiology. Aside from the results called disease from actual traumatism of cell bodies caused by extrinsic agencies, there must be many transient conditions of intracellular rearrangements or molecular disorder, beginning with functional and defensive reactions, long before there can be any ascertainable structural findings. Such molecular changes, beyond the ken of the microscopist, might be assumed to be structural in fact; but the ultimate problem of the search for explaining principles thus tends to become a physico-chemic one. The facts of cell functions should hold an important place in the study of the varying agencies and influences of cell stimulation in the production of symptoms. The relation to physiology of the morphologic side of pathology is especially instructive.

RELATION OF MORPHOLOGY NORMAL AND PATHOLOGIC TO PHYSIOLOGY.

Morphology presents considerations of the highest importance which require special notice in this examination of the mutual relations of the biologic sciences. It is granted that pathology, on the morphologic side, is inconceivable without normal anatomy as its basis. Pathologic anatomy, being dependent on normal anatomy, belongs to the science of morphology. This science, with its great subdivision of embryology, has attained splendid achievements; in the course of its advancement in many specialized lines of investigation in plant and animal life, it has enjoyed the advantage of being able to study the problems of evolution and development in many quickly succeeding generations of vital forms. The scope of its observations has extended farther than from the point of view of medicine, and is reaching conclusions that may yet illuminate some of the dark places of psychiatry. The history of morphology has a special significance in its development contemporary with other biologic science; the changes in its course suggest a law of progress in scientific research that has operated in other fields. After the emergence of morphology, and of physiology, from the keeping of anatomy, the two new sciences entered upon equal domains in the realm of biology. Morphology asserted the independence of the science of form and structure from that of function; the doctrine was that form persists and function varies. It was characterized by the conception of a fixity of types, a rigid adherence to the study of mature forms which it labored to arrange in a perfected and systematic classification. With the breaking

away from these rigid conceptions, during the last fifty years, the course of progress was in the study of the problems of evolution; leading through the investigations concerning the origin of species, it has come to the recognition of the supreme importance of the problems involved in the development of the individual, and of the biologic laws that govern it; and the wide range of variations that may be produced in members of a given species. So in medicine, instead of clinical types, the differentiations of disease are becoming genetic and developmental in character.

In the morphology of plant and animal life, it is agreed on both sides that they are subject to the same laws; in both plants and animals there are identical processes which are consistent with the significance of the cell-doctrine as being fundamental to morphology. In the close relation of form and function the modern conception is that the structural characters of which an individual organism is made up correspond to its functional characters; form characteristics cannot be understood without considering the function characteristics. Physiologic characteristics are transmissible in the same way as the morphologic. The study of physiologic cytology and embryology is revealing the mechanism of the transmission of qualities; with the aid of the experimental methods in the production of variations, in both form and function, there is great progress in the understanding of the laws of descent and inheritance. The close relation of physiologic and morphologic characteristics proves that the problems of form and structure are also physiologic problems. Physiologic processes are influenced and often controlled by the conditions of the environment, both internal and external, and it is held that mental as well as physiologic characteristics are inherited under the same laws. These brief references to the data of morphology serve here to indicate the trend of progress in this science; it points to the conclusion that influences which stimulate functional activity play an essential part in determining the processes of development and the resulting structural forms. The demonstrations of the dominance of the sensory over the motor side of the nervous mechanism is consistent with the fact that all movements are primarily a response to sensory impressions and are performed under their guidance. It follows from the teachings of Hughlings Jackson that cell groups are thus formed by a process of education. All motor phenomena being responsive reactions to stimuli applied to the neuromuscular mechanisms, the laws of use and habit influence functional activity and growth. The unity of all these sciences is also shown. Physiology and morphology have to do with interdependent manifestations of organic existence; there can be no disease until there is first normal life, with whose physical sequels pathology has to deal.

Inasmuch as the whole science of pathology must refer all its material to normal standards, both on the functional and the morphologic side, a like freedom belongs to the minor province of mental pathology; psychiatry is at least justified in seeking directly its immediate explanations in the hopeful, though neglected field of function.

**PATHOLOGIC CONCEPTIONS OF PSYCHIATRY STATED
IN TERMS IMPLYING MORPHOLOGIC IDEAS.**

In such a survey as this, of so complex a subject, certain difficulties have appeared concerning special aspects of current effort, in the field of the psychiatrist's labors. Allusion has been made to the remarkable fact of the disharmony between mental physiology and mental pathology. There are signs of the coming of better cooperation, but so far the general fact is that the psychiatrist borrows from psychology what seems fitting with his pathologic conceptions, and applies some of its psychophysical methods; at the same time he hesitates to use the data and even the terminology offered by expert investigators in mental physiology. The importance of care in the use of descriptive words has been mentioned; an inquiry like this draws special attention to this subject and some extraordinary facts are revealed that should receive further notice.

First among these may be mentioned the use of the word *physiologic*; its frequent infelicitious employment by both pathologists and psychologists themselves emphasizes the width and depth of the traditional gulf between mind and body. The distinction is commonly made between psychic phenomena and physiologic phenomena and the designations "mental side" and "physiologic side" are used to make the same contrast. Mental phenomena are themselves physiologic, but the usage implies a distinct psychic element as an extraphysiologic epiphenomenon, when such a meaning is not intended, and is therefore misleading. The mind event and the brain event are both physiologic.

More remarkable examples of doubtful usage, universal in medical literature, and with far-reaching effects, are shown in the words "disease-form," "disease-entity," "disease-process," and "pathologic process," which have already been mentioned. These words still suggest old meanings now wholly obsolete; this is so obvious that when thoughtful writers use such words for "convenience," the explanation is not infrequently made that it is not intended to imply that disease is a malign entity which invades the living body and works its evil course. Yet, as usage sanctions it, writers continue to employ the framework of words which would once have expressed the ancient parasitic personification of disease. While, in the science of pathology, this extreme conception is corrected by explanation, such words in their modern usage still embody and positively convey the sense of an underlying morphologic counterpart of the symptom-complex that runs its course of progressive degeneration as a disease and reveals the terminal changes in postmortem findings. To speak of all disease in terms used in these senses is to emphasize structural conceptions of pathology, and thus to impede the progress of the reform which is clearly seeking to give adequate attention to functional conceptions in place of the dominating demand for mature types and forms and classifications.

It would be interesting to follow out the history of the usage of these verbal embodiments of whole theories. Perhaps a reference to main points will be enough to indicate the purport of these statements. First, as to the nature of disease, it cannot be correctly conceived as

a state of disordered activity or disorder of a process in an *active* sense; there is a condition produced by a defensive contest between the forces of the living cell and the harmful agencies; it is not a state of perturbed activity, but the result of it in diseased organs or tissues. The causes of disease are extraneous and unnecessary to cell life, which can exist without disease. The only true *process* in living organisms is the physiologic or life process; the forces that cause the reactions called vital phenomena are inherent and are governed by the uniform laws of an invariable order of nature; like effects result from like causes and conditions, and the life process presents the attributes of uniformity and continuity controlled by the laws of descent. Reproduction is an original property of living matter and life is continuous, and death is not due to such a property; this is a proposition in which there would be a general agreement with Weissmann. Roger¹¹ reduces the conception of death to the formula: Death is the result of an arrest of cellular nutrition; whatever the multiple proceedings are that are called into play, the final result is always the same.

A "disease-process" or "pathologic process" cannot be conceived as comparable with the physiologic process; the causes of disease being extraneous to normal cell life, are accidental, multiple, discontinuous, without uniformity. It is consistent with this that even in the problem of tumor growths there are some essential explaining facts; whatever of the various theories may be employed to account for them, they are not indwelling entities, but depend for their existence upon the inherent vitality of the parent organism, acting under abnormal conditions. When the organism dies the newgrowth dies; there can be no disease without prior normal life.

When applied to functional disorders, the assumption of a necessary correlation between a "disease-form" and an underlying structural "disease-process" goes beyond the province of morphologic pathology; it involves the intracellular changes of physiologic chemistry. It is obstructive of a true conception of the wide variations of function that belongs to molecular nutritive and metabolic changes due to variations in condition, irritability, intensity of stimulus, etc., though affecting the same physicochemic operations by the same agencies. But an authoritative insistence upon the "disease-form" and "disease-process" ideas, with respect to all psychoses, has undoubtedly tended to distract attention from a free consideration of functional conceptions of mental pathology. These and kindred forms of words, with their distinctly morphologic stamp, show the character, in some degree, of changing conceptions of pathology. They are kept in use by their convenience; and they appear to be in harmony with certain accepted theories and doctrines concerning the nature of disease and death, and their relation to life. The influence of these doctrines is so great as to require examination here.

The difficulty of determining a sharp limit between life and death has been stated by Verworn¹²: There is no definite time at which life ceases and death begins in a complex organism, for one set of cell complexes may survive another for a long time; but "there is a gradual passage from normal life to complete death, which fre-

quently begins to be noticeable during the course of a disease. Death is developed out of life." "Thus death does not come to the cell immediately, but is the end-result of a long series of processes which begin with an irreparable injury to the normal body and lead by degrees to a complete cessation of all vital phenomena." It is reasoned that "life and death are only the two end-results of a long series of changes which run their course successively in the organism"; also that "death undergoes a development; normal life upon the one hand and death upon the other are merely the remote end-stages in this development, and are united to one another by an uninterrupted series of intermediate degrees." This transition from life to death is termed *necrobiosis*, a word introduced into pathology by Virchow and Schultz; it is understood to mean, according to Verworn, "those processes that, beginning with an incurable lesion of the normal life, lead slowly or rapidly to unavoidable death."

Thus the principle of *necrobiosis* is to be studied in the cell as well as its vital phenomena; and it is held to apply also to the death of compound organisms. By an extension of this conception it explains the condition of natural death in old age, which thus appears to be physiologic. Senile atrophy, which leads finally to death from the feebleness of old age, is to be regarded as simply the end-result of a long developmental series; death in old age is the natural end of an unbroken development and its causes exist in the living organism itself. Life itself never becomes extinct, but there is a continuity in its descent; yet living substance itself, in the form of bodies, is continually dying.

Compare with the foregoing the views presented by Gowers¹² in regard to "diseases from defect of life" to which he gives the designation "abiotrophy" to distinguish a newly differentiated clinical group of conditions and symptoms; he acknowledges Mott's cotemporary recognition of these conditions. The conception is that of "a degeneration or decay in consequence of a defect of vital endurance"; it indicates a failure of life-processes due to defective vitality which seems to be inherent. It is recognized that many degenerative diseases of the nervous system are a result of such defect. The idea is expressed by Mott¹⁴: "the neurones of a particular system die prematurely, owing to an inherited or acquired want of durability, and the regressive process of decay may be looked upon as a nutritional failure on the part of the same cells to maintain that metabolic equilibrium essential and correlative to functional activity." Every nerve cell of the human body is conceived to be "endowed with a specific durability whereby in the health-perfect organism every neurone possesses an equally adjusted vital energy." This is a statement of one of the two ways in which the regressive process occurs, the other being "the metamorphosis incidental to old age manifested by a gradual and general enfeeblement of the functions of the whole nervous system." "In contradistinction to this normal senile decay are the premature pathologic processes of decay attacking groups, systems, or communities of neurones subserving special functions." "The process may be regarded as the inverse of development"; in harmony with these views Hugh-

lings Jackson is quoted in regard to the helpfulness of considering diseases of the nervous system "as reversals of evolution, that is, as dissolution." Mott conceives that the process of primary degeneration is, morphologically, an evolutionary reversal commencing in the structures latest developed.

In the extensive literature concerning the life-processes and their failure in disease and senility other diverging views may be cited, but the purpose here is only to indicate certain ideas and reasonings that bear upon the pathologic conceptions with which psychiatry has had to labor. With respect to physiologic old age ending in natural death, the contending view is that the decline of life manifests the summation of the effects of external injuries, the damage of wear and waste, and is not something different and apart from disease. It is to be noted in the doctrine of *necrobiosis* that the idea of a "disease-entity," with its course and process parallel and antagonistic to the life-process, is avoided by conceiving life or the life-principle as the sole producer of two series of developmental processes, one of which leads to its end-result in the existence of normal being; this life-process is then conceived as turning against itself in another process of producing a series of decrements that reaches to the end-result of nonexistence. One result must exclude the other, and we admit that death is the common goal; the life of every living thing ends in death and there is only one end-result—death is developed out of life. But by shifting the position to the larger view the attempt is to set up a dual conception of two processes, equal, parallel, antagonistic, yet conjoined. The truth is that the whole of life comprehends all living nature; the individual parts that bloom, fructify, and perish, and the fragments chipped and sloughed off from the great embodiment of life in matter, are always dying or dead, but the one chief process of life goes on, and we say that life is developed out of death. The minor casualties of injury and disease represent the chance encounters of living substance in its struggle for existence, with the discontinuous opposing forces of the world of living and material things. Living substance dies, but life is immortal. We may describe, in such figures of speech, the dual developmental processes with their contrasting end-results.

The paradox of the "processes" appears also in the application of the doctrine of abiotrophy which, of itself, helps to make clearer the terms of the problem by the conception of a failure of nutritional energy with a consequent limitation of the durability of the organism and of the length of life. In applying this doctrine to certain pathologic changes, it is said that the overgrowth of interstitial neuroglial tissue, when the nerve elements decay, is in consequence of the fact that the two elements have "a common but inverse vitality"; when the nutritional energy fails to maintain the growth of both, the more highly specialized tissue ceases to live, while the less specialized tends to overgrow with the tendency of the former to decay. It is explained that these "tendencies are in the opposite direction, but they seem to be coincident results of the same vital condition."

In the many wellknown conditions of constitutional

weakness and instability it is easy to understand the nutritional failure to develop normal growth and efficiency of function, or to maintain them, and the consequent recession of the developmental processes, even to the cessation of life. The doctrine of dissolution as characterizing the many conditions of such recessions is clearly consistent. When biologic conceptions are invoked, it is also easy to comprehend the general principles of development whereby, through physiologic reactions of the organism, there are adaptations and modifications of characters due to changes of environment and favorable to life and health; it is intelligible that through use higher types of characters may be produced or through disuse, recessions to more primitive types under the causative influences of the environment, and all this may be within the physiologic limits of the organism as expressions of the processes of life. In the domain of biology it is no doubt, helpful for descriptive purposes to conceive of the developmental forces as acting in an inverse direction, producing the effects of reversals and regressions. But when this latter conception is applied to pathologic conditions, it is in harmony with our prevailing modes of thought in medicine that there is conceived to be an attack, as of some harmful agency, upon the living organism; a pathologic process of degeneration is supposed to ensue which is a regressive process of decay, and this implies its active going backward against the normal tendency of the nutritional energy to maintain life and growth. As a further explaining principle the conditions of acquired or inherited defect are conceived, and a process of degeneration of which "heredity" is the motive force; thus the evolutionary and developmental forces turn against themselves and working in the inverse direction produce decay. Here is seen the all-pervading disposition to seek an immediate cause for every effect, and it is easy to describe agencies and processes. When the stamp of "degeneracy" is fixed upon a fated organism we commonly think of its possessor as a "degenerate" descending to inevitable doom.

Is it not evident that there is a misleading ambiguity in the prevailing usage of the conception of "processes?" It is necessary to the notion of a process that there is a passing over of one set of phenomena into another, and this constitutes a change.¹⁵ A "process" is constituted of a series of such changes when one stage or aspect of the process necessarily succeeds upon another. The action of a causative force or stimulus is essential to the change, as in the biologic processes. The requirements of the conception of two coincident processes appear in the principle of the psychophysical parallelism in the relation of mind and body. It being the general fact that certain changes in those brain and nerve processes with which consciousness is associated are always accompanied by changes in consciousness, and the converse being true also, then certain other scientific principles are involved: (1) The principle of *equal continuity*, with no breaks in either series of changes—if one series is continuous the other must be continuous also; (2) the principle of *uniformity*, when certain phenomena in each series in brain-process and conscious state are essentially associated, then the concomitance of those terms may be

looked for on all other occasions; (3) the principle must be a *universal* one—whenever we find a series of phenomena in either of the parallel trains of events the principle of parallelism has its application. Structure and function must exist before there can be any disease; the phenomena of life represent the supreme process in animate nature; the phenomena of disease and degenerations appear as the results of discontinuous interferences with the life-processes in which "normal function is acting under abnormal conditions"; the assumption of a "disease-process," or of a "pathologic process" in the same sense, fails to meet the essential requirements of a "process"—it is certainly not comparable with the life-process. If we must speak, for convenience, of "pathologic process" and "degenerative process," the terms should be used only in a very narrow sense of comparatively transient interferences, or in the sense of referring to normal function pathologically.*

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[To be continued.]

SOME OBSERVATIONS ON ALBUMOSES IN URINE.

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The first record of a proteid in the urine which gave the characteristic reaction of albumoses, *i.e.*, dissolved on heating to reappear on cooling in the presence of a reagent, was by Henry Bence Jones¹ in a paper before the Royal Philosophical Society of London in 1849. Bence Jones considered this proteid a hydrated deutoxid of albumin, and discussed its chemistry at some length. The same case was reported from a clinical standpoint by Dr. Macintire² before the Royal Medico-Chirurgical

* The writer's views of the inadequacy and misleading influence of "disease-process" conception, as a question in psychiatry, was first presented to the American Medico-Psychological Association at its meeting in Washington in 1902, in an unpublished paper on the principles of mental pathology and the nature of mental symptoms.

Society in 1850, and from his description the case was probably one of multiple myeloma.

Somewhat later other bodies were found in the urine, which gave some of the reactions of the Bence Jones proteid, but differed more or less in chemical composition. These were called peptones and albumoses, and soon after the substance which Bence Jones described was called Bence Jones albumose to distinguish it. Since Maxner's³ paper in 1879, there has been much discussion as to the relation of these various proteids, all of which have certain reactions in common.

It has been clearly established that true peptones, that is, in the sense of Kühne,¹² true albuminous substances which are not precipitated by salting with ammonium sulfate, do not occur in the urine, and hence the term peptonuria should no longer be used. As to the relation of albumoses and Bence Jones bodies, much difference of opinion has been expressed, but a recent paper by G. Paten and Ch. Michel⁴ seems to settle the place of Bence Jones bodies as transition products between albumins and true albumoses, but more nearly related to the latter.

My observations have led me to believe that for clinical purposes we may safely consider as albumoses all proteids in the urine, which dissolve on heating to reappear on cooling in the presence of such reagents as I shall mention. I have not found a case in which they differ in clinical significance, representing, as they do, the earlier stages of disintegration by hydration of albumins, the end-products of which are xanthin bases, uric acid, and urea. Under normal conditions, the end-products of tissue katabolism are reached before they are excreted by the urinary apparatus, but, when tissue disintegration reaches a certain point, this change can no longer be completely brought about, and a part is taken into the blood and excreted by the kidneys as albumoses. The amount seems to vary with the individual and the part of the body in which the excess of tissue waste occurs most rapidly.

The detection of albumoses in the urine should, then, direct the attention of the clinician to the fact that an abnormal destruction of tissue is going on in some portion of the body, or, if such a condition is suspected, lead him to examine the urine for albumoses, that his suspicions may be confirmed. The conditions most likely to give rise to considerable quantities of albumoses in the urine are: Multiple myeloma of bones, a rare condition in which large quantities of albumoses are found in the urine, due to the destruction of bone marrow. Pulmonary tuberculosis, in which condition the albumoses are a guide to the extent of the destruction of the lung tissue. Resolution stage of croupous pneumonia, when large quantities of albuminous substances are thrown into the circulation in a very short time. Septicemia and pyemia, in which there is considerable absorption of partially disintegrated proteid along with the other septic products. Abscesses, especially before they are completely walled off by exudate. Carcinoma

and sarcoma, when sloughing, or when the tissues surrounding them are disintegrating rapidly from pressure or lack of blood supply. In conditions of Hodgkin's disease or leukemia treated with the röntgen rays there seems to be a considerable amount of albumoses excreted. In cases of wasting fevers, especially when the temperature is very high. In fact, whenever excessive tissue waste is suspected, albumoses should be looked for.

The tests for albumoses in the urine are quite numerous, but a critical study of a few of the more common ones may be instructive.

The oldest and probably the most widely used test is that suggested by Bence Jones.¹ This consists in adding to a clear, cooled urine a few drops of strong nitric acid. If a cloud or precipitate appears, which dissolves on heating to reappear on cooling, albumoses are present. When albumins are present, the cloud appears as soon as the urine is warmed, and does not disappear on cooling, the precipitate settling to the bottom of the tube as a granular or flocculent mass. Phosphates may appear as a cloud on heating, but disappear on the addition of nitric acid. Urates often form a cloud on cooling a previously clear urine even in the presence of small quantities of nitric acid, and this cloud disappears on warming the urine, but if the urine is rendered strongly acid by adding $\frac{1}{2}$ cc. of nitric acid to 10 cc. of urine, this will not occur. The same may also be said of acidulating with acetic, sulfuric, or sulfosalicylic acid. If albumins are present in conjunction with albumoses, the urine should be filtered after adding the nitric acid and heating. If on cooling the clear filtrate, a cloud appears which dissolves on warming, albumoses are also present. At times no cloud is seen when the urine is first treated with nitric acid, but after heating and again cooling, a cloud appears, which disappears if the urine is heated. This is due to the fact that the urine contains mucin, which in the presence of a dilute mineral acid and heat, is broken up, one of the products being an albumose. I have thoroughly worked out this point both with urines containing mucin and with artificial mucin solutions.

The advantages of this test are its simplicity and the fact that the reagent is one found in every laboratory. The disadvantages most noticeable are the disintegrations of mucins with the production of an artificial albumose,⁵ the dark brown color produced by adding nitric acid to some urines, which obscures a delicate reaction: and the fact that it is not quite so delicate as some tests that will be mentioned.

Another simple test is the biuret in the cold.⁶ This consists in removing all albumins from the urine, rendering it strongly alkaline with sodium hydrate and adding a few drops of a dilute solution of copper sulfate, when, if albumoses be present, a reddish purple color develops. Gelatin gives a somewhat similar reaction, but is seldom, if ever, found in the urine. This test is much more applicable to urines in which no albumin is

present, as the means of removing this sometimes interferes with the test. I do not consider the test a very accurate one, and it is much better used as a supplementary test, than to be depended upon alone.

Napoleon Boston⁷ has devised a test depending on the presence of loosely combined sulfur in albumoses. He makes especial claims for it as a test for the Bence Jones albumoses, but I find it acts equally well with all solutions of albumoses that I have tried. The test is as follows:

1. Fifteen to twenty cubic centimeters of the filtered urine is placed in a test tube and to it an equal quantity of saturated solution of sodium chlorid is added, and the tube shaken to effect perfect mixture.
2. Two or three cubic centimeters of 30 % solution of caustic soda are now added, shaking vigorously.
3. The upper fourth of the column of liquid is gradually heated over the flame of a Bunsen burner to the boiling point, while a solution of lead acetate (10 %) is added drop by drop, boiling the upper, previously heated stratum of liquid after each additional drop.
4. When the drop of lead acetate solution comes in contact with the liquid, a copious, pearly or creamy cloud appears at the surface, which becomes less dense as the boiling point is neared, and when ebullition is prolonged for from one-half to one minute, the upper stratum shows slight browning, which deepens to a dull black. This gradually fades off to a brown toward the bottom of the tube, but if the boiling is continued for some time a coarsely granular black pigment falls to the bottom of the tube. This is lead sulfid, due to the presence of the loosely combined sulfur of the albumoses.

The advantage of this test is, that it is not readily given by mucins, although after long boiling they are often broken up, as when boiled with a mineral acid. The disadvantages of the test are many. The manipulation is somewhat complicated, especially for one not expert in clinical laboratory work. Phosphates give a decided browning which is very misleading, and, if the quantity of albumoses is small, it is impossible to distinguish between them. The reaction is not nearly so delicate as many of the others, owing to the dilution of the urine with the reagent and the small amount of sulfur in the albumoses to react. When Bence Jones albumoses are found in great quantities, as in multiple myeloma, it should be a valuable supplementary test.

Chas. E. Simon⁸ suggests this simple test. "A small amount of urine is strongly acidulated with acetic acid and treated with an equal volume of saturated solution of common salt. In the presence of albumoses a precipitate occurs which dissolves on boiling and reappears on cooling. If serum albumin is present, which is generally the case,* the hot liquid must be filtered. The

albumoses are found in the filtrate and appear on cooling."

This is one of the most practical tests devised, and has the especial advantage of eliminating, or at least making known, the presence of mucins in the urine to be tested, as the acidulation with acetic acid precipitates mucins, while albumoses remain in solution. Thus by filtering the urine after the addition of the acetic acid, there is little chance for error in the test. The biuret may be applied after this test, and forms a valuable check. The principal disadvantage of this test is in the fact that the dilution of the urine by the reagent, increasing the volume to more than double, renders the test somewhat less delicate than some of the others.

The test which I have made use of in the most of my work is one suggested by Mackwilliam,⁹ but which I have modified to some extent. The reagent used is 50 % solution of sulfosalicylic acid in distilled water. This reagent precipitates on contact all albumins, globulins, nuclealbumins, and albumoses. Peptones are not precipitated by it, but, as the consensus of opinion now is that peptones are not found in the urine, it may be considered as precipitating all the proteids found in the urine. On heating, albumins, globulins, and nuclealbumins are precipitated, while albumoses are brought into solution from which they are precipitated by cold. The technic of the test consists in adding three to five drops of the reagent to 5 cc. of clear cool urine. If the urine be cloudy, it may be filtered through ordinary filters. If this is not sufficient, it may be shaken with animal charcoal and again filtered. In the majority of cases this is sufficient. But in a few cases in which the urine was loaded with germs, I found it necessary to resort to the Pasteur filter. On contact with the urine, if proteid be present, a grayish white cloud appears. If albumoses alone be present, when the urine is heated, it will become clear, to become cloudy again when cooled. If albumins or globulins be present, they will coagulate on boiling. The liquid should then be filtered, and the filtrate cooled, when, if albumoses be present, a cloud will form, which disappears on further heating. This test is very delicate. I have been able to obtain positive reactions in urines which contained 0.08 % of albumoses, when they were not associated with albumins, and 0.1 % when albumins were also present. This difference is due to the extra manipulation necessary to remove the albumin. I might here add that sulfosalicylic acid in this strength is one of the best reagents for the detection of albumin which I have ever used. The test is applied exactly as above and when the cloud does not disappear on heating, albumins are present.

A convenient way of detecting a faint reaction for albumoses is to divide the urine into two parts, cooling one part while warming the other, and then compare them before a dark surface. In this way very minute differences of color and turbidity may be distinguished.

*I cannot agree with Simon that albumoses are found usually in the presence of serum albumin. The kidney epithelium, when normal, does not allow the passage of serum albumin, while albumoses are often found in diseases in which the kidney would not necessarily be affected, and in all probability the renal epithelium offers less resistance to the passage of albumoses. At any rate, in more than half the cases of albumosuria, that I examined, no albumin was found in the urine.

The principal disadvantage of this test is the fact that if mucins be present, they may be broken up by boiling with this reagent, as in the case of nitric acid. However, if care be taken in just bringing the urine to the boiling-point without allowing active ebullition, this difficulty may be overcome, as albumoses go into solution at a temperature considerably below boiling. To this test as to the Simon test, the biuret may be applied, and, as a rule, a purple color is obtained, somewhat darker than that observed after the Simon test.

There have been several more complicated tests suggested by Yarrow,¹⁰ Bang,¹¹ and others, but after carefully examining them, I find no advantages which counterbalance the complicated technic necessary to bring them out.

The following cases illustrate the most common diseases in which albumoses have been found with the leukocyte count in these cases for comparison. The cases in which I have found albumoses of the greatest advantage clinically, are those of involvement of the lungs. In these the albumoses seem to be a better guide to the condition than is the leukocyte count.

In conclusion, I wish to express my indebtedness to Professor Dock, at whose suggestion this work was begun.

CASE I.—A. F., male, aged 22. Surgical ward, University of Michigan Hospital. Diagnosis: Suppurating osteomyelitis.

At the time of observation the wound was well drained, leukocytes varied from 5,590 to 13,000, averaging less than 10,000. Extensive examination showed only traces of albumoses. The wound continued to suppurate, but drainage was very well carried out, and no systemic symptoms developed during my observations lasting four weeks.

CASE II.—A. H., female, aged 10. Surgical ward, University of Michigan Hospital. Diagnosis: Osteomyelitis of lower third of tibia.

When the patient was first examined, there was very little suppuration, and the wound was well drained. Leukocytes, 16,000. Urine showed a fairly marked reaction for albumoses. This continued for five days. The suppuration almost entirely ceased; leukocytes fell from 16,000 to 9,000; temperature fell from 99.3° to 98.6°; and albumoses disappeared from the urine. Patient's general condition improved accordingly. About a week later her temperature rose to 99.6°, suppuration became much more marked, leukocyte count increased to 15,000, and albumoses reappeared in the urine. This condition continued without marked change for four weeks, when my observations ceased.

CASE III.—C. H., male, aged 43. Surgical ward, University of Michigan Hospital. Diagnosis: Suppuration following operation for strangulated hernia.

Wound was well drained, suppuration not marked. Leukocyte count averaging 9,000. Traces of albumoses were present for a short time, but disappeared as the patient's general condition improved.

CASE IV.—C. K., male, aged 38. Surgical ward, University of Michigan Hospital. Diagnosis: Perinephric abscess.

Patient was very cachectic, temperature varying daily

from 99.8° to 101°. Leukocyte count, 16,000. Urine contained albumin and pus. On removing the albumin, large quantities of albumoses were found. Wound suppurated freely and drainage seemed fairly good, but patient gave evidence of increasing absorption of septic products. During the next four weeks pulse became more rapid, temperature curve more irregular, and the albumoses increased in amount. The albumin and pus in the urine remained about the same. Operation confirmed the diagnosis. After the operation, the leukocytes and albumoses decreased slightly, but soon increased again, and the patient died about ten weeks after entering the hospital.

Autopsy revealed a large abscess cavity in the region of the kidney and cultures from the pus showed tubercle bacilli. In this case a part of the albumoses may have come directly from the pus, but as the amount of the albumoses varied independently of the amount of the pus discharged, it seems probable that most of them came directly from the circulation.

CASE V.—E. J., female, aged 26. Medical ward, University of Michigan Hospital. Diagnosis: Pulmonary tuberculosis with cavity formation.

Leukocytes, 15,788. Urine showed no albumin, but rather large quantities of albumoses, which increased markedly during the patient's stay in the hospital. This increase was relatively more marked than the increase in the leukocyte count. The patient died five weeks after entering the hospital.

Autopsy showed that the left lung was almost entirely replaced by two large cavities, one of them containing 200 cc. of turbid fluid. The right lung was also involved, but contained no large cavities.

CASE VI.—R. H., female, aged 23. Medical ward, University of Michigan Hospital. Diagnosis: Pulmonary tuberculosis.

Examination of the patient's chest showed numerous rales, but no distinct evidence of cavity formation. Morning temperature, 98.6°; evening temperature, 99.2°. The leukocyte count on entering the hospital was 9,931. This remained almost constant during the ten weeks that the patient was in the hospital. Two weeks after the patient entered the hospital, while the leukocytes were about 9,000, the urine was examined for albumoses and a wellmarked reaction was obtained. This increased slightly from day to day, so that four weeks from the time of the first examination the amount was about doubled. The leukocytes during this time showed little change. Patient's general condition grew steadily worse. Patient left the hospital and died at her home a few weeks later.

CASE VII.—R. V., female, aged 25. Medical ward, University of Michigan Hospital. Diagnosis: Pulmonary tuberculosis.

Examination of patient's chest showed a few rales, slight interrupted breathing, but no evidence of cavity formation. There was a very slight variation of the daily temperature. The leukocyte count on entering the hospital was 8,912, and during the six weeks that the patient remained in the hospital, the count never went above this point. The first examination of the urine showed small quantities of albumoses. Five days later albumin was found. The albuminuria continued during the remainder of her stay in the hospital. When the patient left the hospital, the disease was considerably advanced, but the leukocyte count was only 7,639, while the quantity of albumoses had gradually increased during this period.

CASE VIII.—M. Mc., female, aged 17. Medical ward, University of Michigan Hospital. Diagnosis: Pulmonary tuberculosis.

In this case both lungs were involved, and there was a markedly septic temperature curve. Leukocyte count, 13,840. Patient was in the hospital seven weeks, and during this time the leukocyte count was constant, but the albumoses were increasing. Albumin was not present. Patient's general condition worse than on entering.

CASE IX.—L. M., female, aged 24. Medical ward, University of Michigan Hospital. Diagnosis: Pulmonary tuberculosis.

When the patient entered the hospital, there were marked physical signs, but no evidence of extensive cavity formation. Leukocyte count, 12,000. Urine examination showed a moderate amount of albumoses, which remained about constant during the two weeks the patient remained in the hospital. Albumin was not present.

CASE X.—J. T. N., male, aged 27. Medical ward, University of Michigan Hospital. Diagnosis: Pulmonary tuberculosis; miliary tuberculosis of the peritoneum.

On entering the hospital, the patient showed marked physical signs with evidence of cavity formation in both upper lobes. Leukocyte count, 19,000. Albumoses present but in rather small amount. Shortly after coming to the hospital, the patient developed miliary tuberculosis of the peritoneum, and died three weeks after his entrance. Autopsy confirmed the clinical diagnosis. The albumoses in this case were not so abundant as the patient's condition would seem to warrant. No albumin was present.

CASE XI.—N. C., female, aged 36. Medical ward, University of Michigan Hospital. Diagnosis: Pulmonary tuberculosis.

Physical signs only moderately marked. Temperature, morning, 99°; evening, 100.2°. Leukocyte count at time of entrance was 8,403, and remained constant during the patient's stay. Urine showed no albumin, but gave marked reaction for albumoses. Patient remained but a week, during which time she grew rapidly weaker, and the albumoses increased in amount.

CASE XII.—J. N., male, aged 22. Medical ward, University of Michigan Hospital. Diagnosis: Pulmonary tuberculosis.

On entering the hospital, the patient showed moderate physical signs, and had a morning temperature of 98.9° with an evening rise to 100.2°. The leukocyte count was 7,639. During the first two weeks no albumoses were found in the urine. At the end of two weeks the leukocyte count had increased to 9,000, and albumoses appeared in the urine in small quantities. The albumoses gradually increased in amount for six weeks, while the leukocytes remained constant. During this time the patient developed a pleurisy with effusion, but this had no apparent effect on the formation of albumoses. No albumin was found at any time. At the end of the six weeks, the patient began to improve somewhat, and albumoses almost entirely disappeared from the urine. Patient left the hospital at the end of twelve weeks somewhat improved in condition.

CASE XIII.—M. W., female, aged 49. Medical ward, University of Michigan Hospital. Diagnosis: Carcinoma of the liver.

Patient complained of pain in the right hypochondriac region and under the right scapula. Loss of weight,

about 30 pounds. At the time she entered the hospital, no mass could be felt below the ribs on the right side, but about three weeks later a hard nodular mass was felt in this region. This increased gradually in size while the patient was in the hospital. Leukocyte count on entering the hospital was 9,931, but from that time until the patient left were not above 8,912. A few days after entering the hospital and before the mass could be felt, the patient began to show small quantities of albumoses in the urine. At first there were small quantities of albumin, which disappeared entirely a little later. After about a month, during which time the albumoses had increased to a considerable extent, they entirely disappeared for a week. At the end of that time they reappeared and continued present in varying quantities during the eight weeks that the patient was in the hospital. About six weeks after leaving the hospital the patient died.

Autopsy revealed carcinoma of the liver with the formation of a large abscess cavity in the center of the liver tissue. The leukocytes, so far as could be learned, had not increased in number.

CASE XIV.—Mrs. A. R., female, aged 54. Medical ward, University of Michigan Hospital. Diagnosis: Substernal sarcoma, with enlarged lymph-glands under the jaw and along the neck.

On entering the hospital, the patient showed an area of dullness beneath the manubrium, extending from the left parasternal line to the right parasternal line, and from an inch above the clavicle to the top of the third rib. Leukocyte count, 7,639. The patient was placed on Fowler's solution, beginning with one drop three times a day and increasing one drop daily to 15 drops three times a day, then discontinued for ten days. Again started with two drops three times a day and increased one drop daily until 15 drops were taken. During this time the enlarged glands disappeared. At the end of three weeks, small amounts of albumoses were found in the urine and continued, with the exception of occasional days, for the five weeks that the patient remained in the hospital. There was no change in the area of dullness beneath the sternum. The patient returned to the hospital after a two weeks' stay at home. She was given Fowler's solution as before, and röntgen rays were applied to the dull area for five minutes every other day.

No observations were made during the first three weeks of the patient's stay, but all subsequent observations were negative during the remainder of her stay in the hospital. The dullness over the sternum did not markedly change during this time. Six months after leaving the hospital patient returned. Dulness over sternum had not materially changed during that time. Patient's general condition was improved. Urine was negative. Leukocyte count, 4,835.

CASE XV.—N. R., female, aged 61. Medical ward, University of Michigan Hospital. Diagnosis: Hodgkin's disease.

On entering the hospital, the patient showed numerous enlarged glands in the neck and axilla. Leukocyte count, 7,639. Urine examination, negative. About three weeks after entering the hospital, the patient was given treatment with röntgen rays over the enlarged glands. Soon after this small quantities of albumoses appeared in the urine, increasing in amount for about a week, then remaining constant until about three weeks before the patient's death. At this time there was a slight increase, which was constant up to within a week of her

death, when observations ceased. At the time of patient's death the enlarged glands had almost entirely disappeared. Death occurred ten weeks after entering the hospital. Autopsy confirmed the clinical diagnosis.

CASE XVI.—R. M., female, aged 16. Medical ward, University of Michigan Hospital. Diagnosis: Hodgkin's disease.

When the patient entered the hospital, the glands in the neck and axilla were markedly enlarged. Leukocyte count, 17,000. Urine negative. While patient was under observation, röntgen rays were not used and the urine remained negative.

CASE XVII.—C. W., male, aged 26. Medical ward, University of Michigan Hospital. Diagnosis: Hodgkin's disease.

On entering the hospital, the patient had a large mass of enlarged glands in the left axilla, glands in the neck and behind the ear were also enlarged. Leukocyte count, 7,920; urine, negative. The day after entering the hospital röntgen-ray treatment was begun, and four days later albumoses appeared in small quantities in the urine. The patient died on the tenth day and no autopsy was obtained.

CASE XVIII.—G. B., male, aged 46. Medical ward, University of Michigan Hospital. Diagnosis: Abdominal tumor with slight obstruction of the bowel; also mass in the left inguinal region.

Examination of the patient revealed a mass in the left inguinal region, the size of a walnut. Sigmoidoscopic examination of the lower bowel showed several masses of low grade granulation tissue which bled easily. The exact character of these masses could not be made out. Leukocyte count on entering the hospital was 6,621 and remained about the same during the patient's stay. Small quantities of albumoses were constantly found in the urine, which was otherwise negative. The patient left the hospital before satisfactory conclusions could be reached, but in all probability the masses were undergoing necrosis in some part of their structure.

CASE XIX.—R. P., male, aged 62. Medical ward, University of Michigan Hospital. Diagnosis: Intestinal obstruction.

On entering the hospital, the patient complained of great pain in the left side of the abdomen, vomiting of foul material, and weakness. Temperature on entering the hospital was 102°, but during the next four days dropped to 98.7°. Leukocyte count at entrance, 7,649; the following day, 9,803; and during the next three days they dropped to 3,820. At the time of entering, the urine showed small quantities of albumins and albumoses. The following day both the albumins and the albumoses had about doubled in amount. During the next 24 hours there was very little change. Then followed a rapid increase in the quantity of albumoses, which continued until the fifth day, when death occurred. No autopsy could be obtained, so that the nature of the obstruction is unknown.

During the last three days before the patient's death, he took considerable quantities of peptonized milk, mostly by the rectum, and it is quite possible that with a more or less completely paralyzed intestine that a considerable part of that absorbed was little changed, and that in part, at least, this was a case of what Harris calls "intestinal albumosuria."

CASE XX.—R. B., male, aged 4. Ann Arbor, Michigan. Diagnosis: Croupous pneumonia, both lungs involved.

The day after the crisis, large quantities of albumoses were found in the urine, which contained no albumin. Albumoses continued for five days, gradually disappearing as resolution advanced. During the whole course of resolution, the urine showed a wellmarked diazo reaction. The urine only was sent to the laboratory, so that I have no record of the leukocyte count in this case.

CASE XXI.—Male, aged 22. Medical ward, University of Michigan Hospital. Diagnosis: Lobar pneumonia.

Patient entered the hospital with a temperature of 103.2°, pulse 92, respirations 48; leukocyte count, 23,937; there were considerable quantities of tenacious, rusty sputum, and other clinical signs of lobar pneumonia. Urine showed no trace of albumoses. On the third day the patient's temperature dropped to 98.2°, and respirations to 28-30, leukocytes to 12,000. Urine began to show marked reaction for albumoses, which increased for two days, then gradually disappeared as the resolution continued, and by the eleventh day were absent.

CASE XXII.—M. E., female, aged 35. Medical ward, University of Michigan Hospital. Diagnosis: Pleurisy with effusion following croupous pneumonia.

On entering the hospital, the patient had marked dullness on the right side reaching to within three finger breadths of the clavicle, considerable difficulty in breathing, some bulging of the right side. Temperature, 100.2°. The leukocyte count at entrance was 6,876, and during the three weeks that the patient was in the hospital never went above this point. The urine at the time of entrance showed no albumin, but a marked reaction for albumoses. This continued without change for three days, and then gradually disappeared. Patient was tapped in the seventh intercostal space in the posterior axillary line, and a considerable quantity of clear yellow fluid withdrawn. This fluid contained albumin and large quantities of albumoses.

CASE XXIII.—H. J., male, aged 33. Medical ward, University of Michigan Hospital. Diagnosis: Sepsis following gonorrhea.

Patient entered the hospital with a temperature varying from 101° to 103°; leukocytes, 11,000; small quantities of albumoses in the urine. Fever gradually declined during the ten days the patient was in the hospital, the leukocytes dropped to 5,432, albumoses disappeared from the urine.

CASE XXIV.—L. H., female, aged 20. Medical ward, University of Michigan Hospital. Diagnosis: Sepsis following induced abortion.

On entering the hospital, patient had a temperature varying from 98° to 100.2°; leukocyte count, 10,441. The following day the leukocyte count rose to 14,260. Urine on entering the hospital showed a faint reaction for albumoses. The following day it was more marked, and remained constant for two days, to be followed by a gradual disappearance as the other symptoms improved.

CASE XXV.—Female, aged 15. Gynecologic ward, University of Michigan Hospital. Diagnosis: Septicopyemia following variola.

Patient entered the hospital with a temperature of 100.6°; leukocyte count, 8,000. There was a considerable discharge from the vagina which contained diplococci resembling gonococci. Urine contained no albumin, but traces of albumoses. Temperature gradually became higher and more irregular, the leukocyte count increased, and the albumoses became more marked.

Patient continued in this state for four months, improving from time to time, then relapsing. Four months after entering the hospital the patient died. Autopsy confirmed the clinical diagnosis.

CASE XXVI.—S. N., male, aged 62. Ann Arbor, Michigan. Diagnosis: Abscess of right lung following pneumonia.

When I first saw the patient he had been sick for about five weeks. He gave a history of pneumonia followed by a severe cough and the expectoration of bloody, foul-smelling material, fever, and sweats. Physical examination showed absolute dullness on the right side below the fourth rib with a somewhat irregular upper border. Temperature, 99° to 103.6°. Pulse running 120 to 140. Leukocytes, 23,000. The urine contained the largest quantity of albumoses I have ever seen, the amount reaching over one-half volume on standing for an hour in a cool place. No albumin was present, but a few casts were seen in every sample.

The patient continued to grow worse, and at the end of ten days I aspirated in the fifth intercostal space in the posterior axillary line. At a depth of about three inches I came upon what seemed to be a cavity, and withdrew about three ounces of brownish-yellow pus, streaked with blood and very foul. Examination of this showed elastic tissue, great numbers of streptococci and many lance-shaped diplococci, probably pneumococci. No tubercle bacilli could be found. The patient improved for a few days after the operation. Two weeks later patient developed a sudden hemorrhage and died in a short time. No autopsy could be obtained.

CASE XXVII.—E. A., male, aged 42. Medical ward, University of Michigan Hospital. Diagnosis: Mixed-celled leukemia.

The leukocyte count on entering the hospital was 48,000. Urine showed no albumoses. Patient was treated with röntgen rays for a few days, then left the hospital without any noticeable change in his condition. Just before leaving, the urine showed small quantities of albumoses.

CASE XXVIII.—M. J., female, aged 37. Medical ward, University of Michigan Hospital. Diagnosis: Splenomedullary leukemia, mixed-celled.

On entering the hospital, the patient had a leukocyte count of 600,000; red cells, 2,800,000; hemoglobin, 68 %. Urine on entering the hospital was negative. Patient was treated with röntgen rays over the spleen for six weeks, during which time she improved somewhat. The leukocytes were reduced at one time to 336,000, but just before leaving the hospital were 477,000. At the end of two weeks, patient showed small quantities of albumoses in the urine, which increased for a few days, and then remained constant as long as the patient was in the hospital.

CASE XXIX.—J. D., male, aged 37. Medical ward, University of Michigan Hospital. Diagnosis: Splenomyelogenous leukemia.

On entering the hospital, blood-examination showed leukocytes, 135,000; red cells, 2,500,000; hemoglobin, 70 %. Urine negative. While patient was in the hospital he received röntgen-ray treatment over spleen for five minutes daily. About ten days after the treatment was begun, albumoses appeared in the urine and continued without change for about two months, the leukocytes gradually increasing during this time. When the patient left the hospital his leukocyte count was 331,000.

CASE XXX.—H. K., male, aged 23. Medical ward, University of Michigan Hospital. Diagnosis: Typhoid fever.

Patient entered the hospital with an afternoon temperature of 105°. Leukocyte count, 5,857. Slight cloud of albumoses in urine. Diazo reaction, and positive Widal. The albumoses continued for about ten days, gradually disappearing as the fever became less marked. Leukocyte count went up to 15,000 on the third day and remained high for ten days, but patient had no other severe symptoms.

CASE XXXI.—H. J. S., male, aged 18. Medical ward, University of Michigan Hospital. Diagnosis: Typhoid fever.

On entering the hospital, patient's afternoon temperature was 105°, and for three weeks ranged from 104° to 106°. Leukocytes at entrance, 4,329, and at no time over 5,000. Widal positive. Urine during the first three weeks showed fairly wellmarked reaction for albumoses, gradually lessening as fever declined.

CASE XXXII.—R. W. G., male, aged 21. Medical ward, University of Michigan Hospital. Diagnosis: Typhoid fever.

On entering the hospital, patient's afternoon temperature was 104°, ranging from 103° to 104° for about a week. Leukocytes, 5,440, at no time above 7,500. Widal positive. Urine showed no albumoses at any time. The fever had a rather mild course, patient leaving the hospital in less than five weeks after entering.

CASE XXXIII.—G. J., male, aged 26. Medical ward, University of Michigan Hospital. Diagnosis: Typhoid fever.

On entering the hospital, afternoon temperature was 103°, gradually increasing to 104.2° at the end of five days. Leukocytes at entrance, 7,000, which was the highest count. Widal positive. Urine on entering the hospital negative, except diazo reaction. Five days later, while the fever was at its highest, albumoses appeared in the urine and lasted for about a week, gradually disappearing as temperature subsided.

CASE XXXIV.—M. B., female, aged 26. Medical ward, University of Michigan Hospital. Diagnosis: Typhoid fever.

On entering the hospital, the patient's afternoon temperature was 104°, and did not again reach that point. Leukocytes the day of entry were 7,639, which was the highest count in the case. Urine showed trace of albumoses the first three days, after that was negative.

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RÖNTGEN RAYS IN EXTERNAL TREATMENT.*

BY

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Mode of Action of Röntgen Rays.—McLeod²⁴ quotes Pusey as expressing the belief that while the rays have no bactericidal effects in the laboratory, the disappearance of pus in certain cases and the cleaning of lesions seem to indicate some action *in vivo*. The more probable explanation is that they set up a reaction in the tissues and a flow of serum which act as germicides. McLeod further says that the rays cause devitalization, degeneration, and destruction. Sometimes the cell toxins produced seem to set up, in the ray-weakened tissues, ulceration, necrosis, and sloughing—healing with vascular and imperfect scars. He very correctly states that mild doses of the rays have a stimulating effect upon the healthy elements of the skin. Large doses and long exposures, nearness to the tubes, etc., devitalize the elements, interfere with regeneration, cause degeneration. The more highly differentiated structures, as hair follicles, glands, both sweat and sebaceous, the nails and the bloodvessels, are more readily and intensely affected than the less distinct element. Pathologically altered cells, of epiblastic or mesoblastic origin, are far less resistant than healthy cells. He states (truly) that while these are being destroyed, the healthy cells may be stimulated to actual repair service.

Action of cell toxins from cumulative effects of röntgen rays may cause the train of severe symptoms mentioned, serious destruction, slow and imperfect repair. I find no mention of action upon the nerves, but with mild treatment there follows often relief of itching or pain. Burns of intensity are sometimes followed by agonizing pains, requiring the use of morphin, and lasting for days, weeks, or, as in neuritis, for months. Some of these burns alternate healing and relapsing, and their end is hard to foresee.

The toxins from tissues broken down *en masse* may produce a general toxemia, reaching a lethal termination. Kienböck¹¹ mentions much the same wellknown effects of the rays, as destruction of young and proliferating cells, hairs, epidermis, and also the epithelium of the spermatic ducts. The latter brings to mind recent discoveries of aspermatozoa in persons too much or too closely exposed to the röntgen rays, this condition sometimes becoming permanent. Kienböck says that microscopic changes in cells may be noticed a few hours after treatment, and marked inflammatory changes after one

to three weeks. It has not been my ill-fortune to be troubled with this extensively reported tardy development of röntgen-ray reactions. In my cases development of reactions has been regular and progressive, often subsiding shortly after suspending use of röntgen rays, but a few times a sudden and violent outbreak occurred, very difficult of explanation, and extending far beyond the exposed area.

The writer last quoted attaches no importance to idiosyncrasy (nor does Franklin),¹⁵ but he does not refer to the difference in susceptibility of the various skins, their reaction in the primary degrees resembling their individual tolerance or intolerance to the sun's rays.

While röntgen ray therapeutics has become established as a most valuable aid in the treatment of disease, and rules for accurate work are being formulated, a personal knowledge of the patients treated and a thorough acquaintance with one's own apparatus, are necessary for successful work. We must acquire a familiarity with the action of the tubes at different vacuum and under varying conditions of weather, and not forget the atmosphere of electricity complicating the treatments.

Equally good results follow the use of the coil and the static machine in properly selected cases. My own apparatus is the coil, electrolytic break, perfected by the addition of some special appliances. The vacuum of tube used and time of exposure are fitted to the needs of the case. The production of the "sunburn" reaction is often desirable, of more marked burns only as needed. Slight burns are necessary in most cases of skin diseases, deeper burns only when deep destruction must be produced. In malignant lesions or growths the latter are often required, but the treatment must be so given as to destroy, if possible, every diseased cell, else those remaining grow more rapidly in the tissues rendered weakly resistant by the röntgen rays. As much cancerous growth as possible should be excised or curetted away at the beginning, because the wounding of the tissues lowers their resistance to the rays and instrumental removal leaves less work for the rays in the destruction of the disease.

Watchfulness, discretion, and patience are essential in the work. In my röntgen-ray experience I have come to expect to cure at least temporarily, often permanently, all cases of superficial epithelioma and rodent ulcer, to benefit most deepseated cases, to cure no far-advanced case of cancer. Often the patient chooses röntgen rays because of the absence of pain in the treatment; often the case is amenable to no other method. It is the only treatment for many conditions. I expect to be able, given sufficient time, to free patients of superfluous hairs, obstinate acne, comedones, some eczemas, psoriasis at least temporarily. Warts and precancerous lesions, diseased hairs in ringworm and favus of the scalp, and other hair affections, as pustular sycosis and ringworm of the beard. Mycosis fungoides seems to have no other remedy. Authorities quoted below express my views after four years of practical work with the röntgen rays, save in a few instances in which they directly contradict a mass of evidence.

In a large experience with this treatment one learns to select appropriate cases, to make few or no promises,

*Read at meeting of the Medical Association of Georgia, April, 1905, at Atlanta.

and to expect some disappointments. When the evidence from all sources is sifted, rubbish removed, and the clean facts left distinct, the conclusion is fixed that röntgen-ray treatment has a definite and permanent field.

Diseases Reported Cured by Röntgen Rays.—Saboraud and Noire.¹¹ Ringworm of scalp is difficult to cure, because of depth of fungus in follicles and permeation of hair roots, with the germ beyond the reach of germicides. Saboraud reports 327 cases of this disease in hospital practice, in which cure occurred in a year. Other cases are reported by Sale Barker.⁴ Saboraud's interval treatment of the scalp consisted in the use of weak solution of iodine; Barker's, of ointment of ammoniated mercury.

Bowen⁷ quotes Belot: To obtain a cure, every diseased hair must be made to fall. The hairs regrow, unless treatment has been too severe.

Kienböck reports cures in cases of scalp ringworm, and of the variety known as barber's itch. Dunn¹⁶ refers to the value of the rays in similar cases, and Saboraud²² further reports both on the ringworm and favus cases.

Sycosis vulgaris has been reported as benefited or cured by Montgomery⁸ and Bowen-Belot.⁷

In lupus vulgaris, cures or good results are recorded by Burns.³ C. J. White cites the more rapid improvement following preliminary curetting. Gibson, Kienböck,¹¹ and Pancoast report benefit without cure. Pfahler¹² reports a cure of lupus vulgaris of the lip, chin, inner canthus, and mucous membrane of the nares and lip, treatment being applied directly to the external lesions alone. Other good results are reported by Dunn.¹⁶ Many cases are reported in which cures were not fully established.

Lupus vulgaris is rare in this climate. One cure and one apparent cure were noted when the two patients so treated by me were last seen. Belot¹¹ does not think the röntgen rays particularly better than other methods in lupus vulgaris.

Belot says alopecia areata is cured by mild treatments with röntgen rays, the hair being stimulated to growth. Kienböck considers this disease easily curable by this treatment. This method is thoroughly practicable in these cases provided the reaction is not so great as to produce permanent atrophy of the follicles, with defeat of the purpose exercised.

The type of "birthmark" known as "port wine" has been changed from hypervascular area to scar tissue by the exudative "burn" of the rays. The unsightliness of the scar is scarcely to be preferred to the original disfigurement. Cases are reported by Lavack.⁵ Belot⁷ records great improvement in these cases after violent reaction was produced. Dunn¹⁶ justly criticizes the results of treatment of these vascular areas.

Paget's disease of the areola and nipple with resultant carcinoma are reported practically cured (quoted 6). Fordyce²⁰ showed at the meeting of the New York Dermatological Society a case of this disease affecting the gluteal regions, cured by röntgen rays.

Bowen-Belot⁷: The latter considers the röntgen rays inferior to electrolysis in hypertrichosis. Gibson¹¹ ob-

jects to their use in this class of cases because of the "atrophy of the skin, telangiectasis and depigmentation occurring even after an interval of a year or more." This observation is too radical. A feminine face disfigured with hairs and perhaps comedones and pimples, with open gland mouths, certainly profits by the substitution of a smoothing of the skin, loss of the hairs, and disappearance of all these unsightly lesions. The skin does sometimes acquire a thinned and smooth look, but is not disfigured as the writer asserts. The bad after-effects that he mentions have failed to come under my observation. Beaded hairs (*Trichorrhexis nodosa*) fall after röntgen-ray treatment and regrow normal. Dunn¹⁶ publishes satisfactory results in hypertrichosis. Pusey and many others have found röntgen rays the only treatment in many of these cases. This coincides with my experience.

Belot⁷ thinks only rebellious cases of acne should be treated by röntgen rays. Gibson¹¹ reports good results in acne rosacea and comedones. Pfahler¹² concludes that röntgen rays best meet the indications in acne; relapses are less frequent. It is not necessary to produce severe burns and the slight atrophy will not be likely to occur if burns are prevented. A slight erythema slowly acquired is sufficient. In the main his results correspond with mine.

Belot⁷ (Bowen) does not approve of the treatment of psoriasis by röntgen rays unless the case is severe. On the other hand, Gibson¹¹ reports the ready yielding of mild cases of this disease, although treatment does not prevent relapses. I have been able to remove this eruption more easily with this method of treatment than with any other, and from the face for a longer time.

Bronson²⁰ reports seborrhea as improved by the use of the röntgen rays. Ordinary warts (verrucae) yield nicely to this form of treatment.¹¹ Telangiectasis is reported to have occurred a year later in one case.⁴ Belot-Bowen⁷ report four cases of keloid beneficially affected by mild treatment with the röntgen rays, and Pancoast¹⁰ reports one case cured, others unaffected.

Gibson¹¹ and Dunn¹⁶ state that eczema cases showed good results. Montgomery, of San Francisco, reports some of those cases of vesicular eczematoid disease constantly relapsing, affecting the fingers chiefly, but often the toes, and very intractable to usual treatment, as cured by röntgen rays.

Belot⁷ reports two cases of scleroderma improved by the rays. A case of lupus erythematosus has been reported cured by the same author. By Dunn¹⁶ and Gibson¹¹ seborrhea (presumably the oily form), hyperidrosis, pruritus,¹¹ prurigo, lichen ruber are reported likewise cured.

Mycosis fungoides, a disease hitherto unyielding to any treatment, now shows many, at least temporary cures, and a few apparently permanent cures, as reported by Belot⁷; Gibson (who mentions relapses). Belot¹⁴ reports the disappearance of all symptoms, the terrible pruritus decreasing rapidly. Carrier¹⁹ reports the complete disappearance of all subjective and objective symptoms in the case of a man of 75, the disease having been present 12 years. Pusey²¹ mentions numerous cases from the literature—Schultz, Jamieson, Stainer, Riehl,

Marsh, Hyde, Montgomery and Ormsby, Brocq, Bisserle and Belot.

Lustgarten and Elliott,²¹ at a meeting of the New York Dermatological Society, also Bulkley,²² mentioned cures in the same disease.

Various pruritic affections are benefited or relieved⁷ (Gibson,¹¹) and itching and pain. Belot⁷ says some sarcomas have yielded more readily than similarly situated epitheliomas. Pancoast¹⁰ does not think that sarcomas as a rule do well under this treatment. Gibson¹¹ asserts melanomas yield, the cells of the soft, rapidly-growing type being especially sensitive to the rays and speedily destroyed.

Beclere¹³ twice operated in recurrent sarcoma of the malar bone and orbit. After operation cure was established with 40 röntgen-ray treatments. I had a similar case, patient became too weak to continue treatment.

Belot¹⁴ reports two cases of the melanoma type improved, and two of the diffuse cutaneous variety benefited by very few treatments. Dunn¹⁶ has also published favorable results in sarcoma.

Warren⁸ and Codman⁹ warn us against the use of the röntgen rays as a substitute for operation in epithelioma. This warning should not apply to the physician or surgeon who uses the rays either because operation is inadvisable, or impracticable, or meets positive objections from the patient. Pancoast¹⁰ advises excision of malignant growths prior to the use of the röntgen rays. This or curetment is almost always desirable if permitted. He also refers to apparent cures followed by relapses. This is also true in the cases in which operation was done.

Gibson¹¹ states that superficial epithelioma and the type known as "rodent ulcer" find almost a specific in röntgen rays properly employed. He does not advocate routine operating preceding treatment, save in cases in which drainage must be established.

Pfahler¹² records case of epithelioma of the lower lip, with submaxillary gland involvement, rendered operable by the disappearance of the gland trouble under röntgen rays. Why the lip trouble did not yield is not stated. Dunn¹⁶ also reports favorable results in epithelioma. Allen¹⁷ showed to the New York Dermatological Society a patient who had multiple epithelioma cured by the röntgen rays.

As to the prevention of recurrences, proper thoroughness, correct strength of treatment, and, if needed, adjunct methods, must all be employed. Improper treatment often causes the very conditions we desire to destroy.

Gibson¹¹ says endotheliomas of the face may shrink under röntgen rays, either temporarily or permanently.

As is well known to the majority of röntgen-ray workers, carcinoma of the breast¹¹ is only temporarily and partially improved by this method of treatment, but Morton²³ has reported cases of carcinoma of the breast, axilla, etc., apparently cured by the external application of röntgen rays (and radium), together with fluorescence internally by the administration of fluorescin, radioactive water, or quinin bisulfate. When cases are inoperable or recurrence happens, the röntgen rays are indicated, and it is well to employ internally these fluorescing substances.

Tuberculous glands of the neck, and also Hodgkin's disease, are reported by Dunn¹⁶ as having been satisfactorily treated. Finch and Allen¹⁷ reported cases of Hodgkin's disease successfully treated.

Precancerous conditions, as flat, semiwart, slightly infiltrated, at times eroded, epithelial-crusts or scaly, or warty conditions on the backs of the hands, as well as on the face and neck, seen especially in some florid skinned and elderly people, often much exposed to the weather, yield beautifully to röntgen ray treatment.

It must not be forgotten that mild prolonged or short strong exposures of the skin or incomplete action of rays may actually produce epithelioma, and that imperfect and unskillful röntgen ray exposures can so complicate a case as to render the use of any treatment, or hope of cure, quite vain.

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THE INFLUENCE OF THE EVENT OF THE TUBERCULOUS UPON NATIVE POPULATION.¹

BY

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That my paper may be as useful and practical as possible to this association, I have limited my work to include only the white native population at the open resorts of the United States (by open resorts meaning those where the tuberculous mingle freely with the native inhabitants).

The literature upon this subject, of the danger to any community from infection caused by imported cases of tuberculosis, seems to show very clearly that when the tuberculous are treated in closed sanatoriums the death-rate from nonimported tuberculosis among the native population is lowered, the influence of the closed sanatoriums being in every case an educational one, instructing the natives how to avoid infection.¹ But in the open resorts of Europe some difference of opinion exists as to the relative danger of infection from visiting tuberculous invalids, and instances have been cited, especially from Mentone and Nice, to show the danger from this source; while from the time of Bennet to the present, writers

¹ Read at the meeting of the National Association for the Study and Prevention of Tuberculosis, in Washington, D. C., May 18 and 19, 1905.

have mentioned these resorts as typical instances where infection was active.²

As I could obtain no reliable published reports upon this subject, I wrote a number of letters to several physicians in different open resorts in Europe. In reply, Dr. Holland, of San Moritz, writes me, March 3, 1905, that he is positive there has been no increase in tuberculosis among the native population due to tuberculous invalids. The *Courier* for March, 1905, publishes a positive statement to the same effect. In a letter to me, Dr. E. Neumann states that there has been no infection of the native population (March, 1905). Dr. William R. Huggard, of Davos Platz, also replies as above, while the official registers of the Davos Platz district (1876-1900) show that during the 25 years from 1876 to 1900 the total number of deaths from tuberculosis among the native population of Davos was 38 persons, the total population in 1900 being 8,334. This was the general opinion expressed in a number of such letters received by me from open resorts in Europe and is decidedly at variance with the preconceived ideas generally expressed. Dr. F. M. Sandwith writes me from Cairo, Egypt: "There is no evidence that tuberculous invalids sent to Egypt have been a source of danger to the natives." From Clarmont, Cape Town, South Africa, Dr. Eyre writes me (March 21, 1905): "The infection of native races by imported tuberculosis has been very marked, and this is especially the case in the more crowded centers of population." It must be remembered, however, that he is speaking of native races, and not the white man. He also says: "Yet, when large labor gangs of pure Kaffirs are employed in gold mines, harbor works, etc., the individuals comprising them then display the same tendency to infection."

It is thus evident that even when native populations do not apparently come in contact with the tuberculous, the result seems much the same, for crowding together in bad air is the main cause of tuberculosis, the proper soil for rapid growth being of more importance, apparently, than the number of seed sown. From many of the Pacific islands³ we have reports showing how the natives succumb in large numbers to tuberculosis, and apparently such natives show little, if any, resistance, the disease generally destroying life with a rapidity rarely seen among white races. Dr. Coleman has shown the lack of resistance in the negro, while I have myself seen striking instances of the lack of resistance among our Indians in Colorado, Wyoming, and Utah; not the civilized Indian who lives in a cabin and is weakened by bad air, alcohol, and syphilis, but the Indian hunter, living in the open air, with excess of proteid food. Even under such favorable conditions, and in an ideal climate, I have seen individuals become infected and die in two months, the racial resistance being so low. Hence, in estimating infection among savage or semi-savage races as a basis for comparative study, due caution has to be observed, since the native races have a lowered resistance as compared to white races; and as the guineapig differs from the dog, so we differ from native races in physiologic resistance to tuberculosis. We have been subject to the law of selective elimination, and it is due to this law that tuberculosis has not

only diminished among us, but has also left those whose resistance is on a higher plane. While the native savage races are now undergoing the beginning of their evolution, we are nearing the end of ours. Other diseases, such as smallpox, measles, etc., show the working out of the same general law in the case of civilized man and his dark-colored brothers.⁴

The closed sanatorium for the tuberculous in the United States has the same influence in lowering the nonimported tuberculous deathrate as it has been found to have in Europe.⁵ It is, however, the so-called open resorts for the tuberculous in the United States (the many villages or cities located all over our country in favorable climatic situations) that should repay our study as to the influence the event of the tuberculous has upon native populations. It is in such places in our country that the danger would seem to be urgent, since the conditions are apparently ideal for infection. The resident population, as a class, has shown a susceptibility to tuberculosis, many families having lost some member by the disease; for, while it may be true that a tuberculous parentage induces a certain resistance in the offspring, it is equally true that tuberculosis appearing in a brother or sister indicates a lower plane of resistance among the other children of that family.

It is a wellknown fact that in the average open resort of the United States the precautions against infection from dried sputum are woefully inadequate, and with few exceptions there are no laws enforced for the disinfection of rooms, eating utensils, or soiled clothes, even when the tuberculous invalid lives in close and indiscriminate contact with the nontuberculous, in boarding-houses, hotels, public buildings, etc. In addition to this, the tuberculous frequently marry, one or both parties of this union being tuberculous, and they have children who are "under fire" from tuberculous germs from birth.

The population of most of these open resorts in our country has increased rapidly during the last ten years, the industrial indoor occupations have, in many cases, increased at a similar rate, both factors predisposing to the extension of tuberculosis; and if what we have been taught is true, namely, the number of tubercle bacilli from dried sputum in the air is a criterion of its infectiousness, certainly the air in our health resorts must have an excess of these germs and be correspondingly dangerous to the nontuberculous inhabitant. Therefore, it has seemed to me that on purely theoretic grounds the danger from tuberculous infection at these open resorts could not fail to be a serious one, and any investigations on a scientific basis could but confirm this theory. To obtain any reliable data upon this special subject is a very difficult matter, and as there are no statistics published covering a field broad enough for comparative study, I have been forced to obtain what I could by circulars and personal letters. I have therefore sent circular letters to several physicians in each resort, men whose experience and judgment warranted careful and accurate answers, and in addition, I wrote personal letters also when the circular letter seemed to be deficient in detail. The prompt and generous response to practically all letters sent by me was most gratifying, and

showed the interest taken in the subject. I wish now to thank the writers publicly, and acknowledge my indebtedness to them. The questions were as follows:

1. Among your native population have you known of any cases of tuberculosis contracted from your imported tuberculous invalids?
2. In your opinion, have tuberculous invalids sent to your locality been a source of danger to your native population?
3. Has your nonimported tuberculous deathrate increased since the event of tuberculous invalids coming to your locality?
4. Have indoor industrial occupations become more frequent in your locality than formerly?
5. Do you have any law enforced regarding the disposal of expectoration from tuberculous invalids?
6. Are rooms inhabited by such invalids disinfected?

I had answers from resorts in Massachusetts, Connecticut, New York, North and South Carolina, Virginia, Georgia, Texas, New Mexico, Arizona, Utah, Colorado, and California. With very few exceptions the answers may be summed up as follows: While it was thought that imported cases of tuberculosis might be a danger to the native inhabitant, most of the men had never seen a case of infection from this source, and the general opinion (about 90%) was that the danger was much exaggerated, that after years of practice they had never seen a person so infected, and the danger in theory and fact differed materially. In regard to increased deathrate from nonimported tuberculosis there were no figures available. Indoor industrial occupations had increased in the average resort, and with few exceptions no laws regarding the disposal of tuberculous sputum or disinfection of rooms were enforced.

The replies from all these physicians practising at our open health resorts were in the main the same; that is, all agreed that the imported tuberculous invalid was of no danger to the native population so far as could be observed by them after many years of active practice. This opinion is certainly at variance with all established theories. How do we account for this? Of course it can be objected that I have collected personal opinions only, with no accurate statistics, and that in this way personal prejudice, carelessness in answering questions, etc., might have made the reports collected by me in this manner of slight value, or as Cornet has sceptically expressed it, "Natives in admitting cases of infection thereby imperil their most precious interests." Be this as it may, these reports I have collected this year of the nonoccurrence of infection, or its marked infrequency, at our open health resorts, do not stand alone in what I show in this paper. Other scientific work has been done in the past regarding two of our resorts. Dr. Edwin R. Baldwin,⁶ in a paper read in 1900, has shown very conclusively that the danger from infection at Saranac Lake, New York (a town of 2,000 inhabitants), is very small. He also writes me on March 10, 1905: "I am glad to say the experience up to date does not change the conclusions arrived at by me in 1900." Of course, at Saranac Lake the conditions are unusual. The personnel of the physicians and the object-lesson of the sanatorium count for much, but there must be many cases of exposure of susceptible individuals to the germs of tuberculosis, enough to warrant, from a

theoretic standpoint, more cases than 20 in which infection has occurred in 15 years. Probably most towns of 2,000 inhabitants in the United States show as many nonimported cases in 15 years—towns which have no reputations as health resorts, and where the tuberculous rarely if ever come as health seekers, and infection from invalid sources is, therefore, rarely a possibility.

If I may be pardoned for referring to my own work on this subject, I can say for Colorado Springs (an open resort) that the danger from infection in proportion to population seems to be even less than at Saranac Lake. In 1892, after several years of careful investigation, I reported only 10 cases of nonimported tuberculosis occurring in 15 years, the population at that time being about 15,000;⁷ again in 1897 I reported to the Climatological Association the result of a systematic search for all cases originating in Colorado Springs, and the total number in 20 years was 20 cases,⁸ so that for Colorado Springs I have since 1889 neglected no opportunity to collect a list of all cases of nonimported tuberculosis occurring among the resident population or visitors. I have been aided in this by the physicians who are themselves interested in the subject, and our different health officers have also done all in their power to trace and report such cases to me. The result of this investigation has shown that at Colorado Springs, with a population of from 15,000 to 30,000, there has been but one case each year originating among the native population, or 16 cases of pulmonary tuberculosis in 16 years occurring there in persons who were not tuberculous when they arrived, although some of these persons had been away at the seashore and other places on prolonged visits and may have been infected before coming to Colorado. I have no record of other forms than pulmonary tuberculosis, but meningeal, glandular, or bone tuberculosis is not more frequent than in many other places, although a large proportion of our children have a tuberculous parentage, and precautions against infection are not enforced to any extent.⁹

It has seemed to me rather remarkable that from about every open health resort in the United States that receives the tuberculous, and where large numbers of such invalids have been living for years among the native population, the reports all show that the infection has been limited to such a degree. It is certainly a striking fact that from these resorts the average rate of cases per population is considerably less than in many towns or cities where there are very few tuberculous invalids. Health resorts, therefore, from all reports that I can gather, are less dangerous from an infectious standpoint than the average towns in the United States, and if these records are correct, either infection is a myth or some factor is at work in these open resorts for the tuberculous that modifies the infection from this disease. It is probable that several causes contribute to this evident restriction of infection at these resorts. In the first place, we are apt to ascribe entirely too rapid an action to this infection from tuberculosis. We now know that the moment of actual infection with the tubercle bacilli is often far removed from subsequent symptoms that arrest the attention of patient or physician. Tuberculosis is so often slow and insidious in its action, and its latency is, I believe, far more common than is

generally known, and our impatience to ascribe a recent cause frequently clouds our judgment as to the time of real invasion. I have frequently seen cases reported as due to recent infection, when careful inquiry disclosed the fact that the disease in a more or less latent form had been invading the tissue for years, perhaps since childhood, when from tonsil to lymphatics it had been slowly working its way, without any disturbance of the general health, until some depressing factor determined the sudden activity that reacted through the whole body. Such cases are often classed as reinfecting from outside the body. In average health resorts these depressing factors among the permanent inhabitants operating as open doors to tuberculous extension or renewed activity are probably not as prevalent as elsewhere, and therefore latent or undiscovered tuberculosis is less apt to be aroused to activity in these places. While the individuals comprising the permanent population of our open resorts are no doubt exposed to tuberculous germs more frequently than the inhabitants of our average villages, or even cities, at the same time the individual resistance is better. The climate has more available sunshine, the soil is drier, indoor occupations comparatively infrequent, the food is superior, and, above all, the crowding of the tenement dwellers in bad air is largely avoided. Then, too, there is no doubt that, although knowledge regarding the laws governing the extension of tuberculosis is decidedly lacking among most people, it is probably true that the permanent inhabitants of our health resorts are, as a class, becoming every day more and more alive to the dangers from this disease, and from direct observation are, in a general way, becoming trained to note the advantages of efficient ventilation.

In fact, my records show that the natives of open resorts for the tuberculous are in a better physiologic condition to resist tuberculous infection than the average inhabitants of other towns and cities; and all the facts seem to prove that it is better to be daily exposed for years to the germs from the tuberculous in a superior climate than not to be so frequently exposed, but to be under the influence of bad air and overcrowding in an unfavorable climate; that the event of the tuberculous among the dwellers in our resorts is not as dangerous a factor as it has been supposed to be; and that the lesson to be drawn from this is to increase human resistance by proper ventilation day and night, and then the tubercle bacillus will lose its power to infect mankind or destroy life.

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DIGEST OF MEDICAL LITERATURE

CLINICAL MEDICINE.

DAVID RIESMAN
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ANKYLOSIS OF THE SPINE.

THE LITERATURE COLLATED AND COMPARED.

BY

THOS. STOTESBURY GITHENS.

(Spondylosis, spondylose rhizomelique, stiffness of the spine, osteoarthritis of the spine, arthritis deformans of the spine, rheumatoid arthritis and chronic rheumatism of the spine, hereditraumatic kyphosis, v. Bechterew's disease, Kummel's disease, Marie-Strümpell disease.)

Many articles have appeared recently on a somewhat rare disease, which consists in rigidity of all or part of the spine, often associated with changes in the joints of the limbs. The pathology is obscure, as less than 20 cases with autopsy have been reported, but about 80 museum specimens without clinical data are described.

About 200 cases have been reported, and when we study their histories to determine the etiologic factors, we find 35 ascribed to trauma. Acute articular rheumatism or prolonged gonorrhea appears in 53 histories, and about 15 more seem rheumatic. Tuberculosis is mentioned in a few cases and has been found in a large proportion of the autopsied cases. Its importance is strongly upheld by Poncet, but its frequency may be due to susceptibility from lessened expansion as a result of the kyphosis and ankylosis of the ribs. Syphilis figures in several histories, mostly of the nervous type. In many cases the spinal changes seem to depend on lesions of the nervous system. Several authors claim that heredity is an important predisposing factor.

Pathologically the spines described fall into two fairly

wellmarked groups. In the first the process begins as a true ankylosis of the articular processes, which is followed by ossification of the ligaments, interspinal, flava, costal, and anterior common, and in some cases by ossification of the intervertebral discs, while in the second, union of the vertebrae is effected by osteophytes or plate-like masses which spread over the side of the vertebral bodies or connect the transverse processes, ribs, etc. A third form may, perhaps, be distinguished, in which there seems to be an extension of bony tissue from the edges of two approximate bodies which grow together over the disc and produce the impression that the outer layer of the disc has become ossified. This grades off into the second group, which is frequently associated with arthritis deformans in the limbs, and seems to be a form of this disease.

The course of the disease as gathered from the case histories is extremely variable. Formerly great stress was laid on the involvement of joints of the limbs and on the part of the spine first attacked, but other factors must also be taken into consideration, and especially the etiologic one. Ordinarily the disease begins with pain in some part of the back, and perhaps shooting pains in the corresponding nerves. The part steadily becomes stiffer, and as it does so the pains diminish, ceasing when rigidity is complete. There may have been a long history of rheumatic trouble in the large joints, or such trouble may accompany or follow the spinal changes. In some cases the entire spine is affected at once during an acute febrile attack, and more frequently part at a time in a series of such attacks. More rarely the history shows a long period of nervous symptoms, especially motor, paralyzes, atrophies, contractures, perhaps associated with paresthesias and shooting pains. In one case trophic ulcers are reported. In other cases there is no pain and the deformity is the only symptom noticed by the patient.

Considering each of these factors the cases may be divided into the following groups: (1) Senile and occupation kyphosis; (2) traumatic; (3) rheumatic; (4) osteoarthritis or arthritis deformans of the spine; (5) nervous or muscular.

I. Senile.—The senile form is so frequent that not much attention has been paid to it clinically, but it is often stated that in the dissecting room it is not uncommon to find the discs atrophied and the bodies of the vertebrae connected by a flat mass, which resembles plaster-of-paris poured on from above and allowed to harden in a thin layer on the side of the body. It is claimed that the mass rarely reaches the middle line in front or the intervertebral foramina behind. This is seen only in the bodies of old persons and usually in those whose occupation has required a stooping posture, such as farm laborers, tailors, etc. The cervical and upper dorsal region is usually alone affected. Several of the specimens described from anatomic museums are probably of this type, and although many show the mass reaching the middle line anteriorly or covering the entire body, they were probably preserved because unusually extensive. The arches are entirely free from ankylosis, although there may be signs of atrophy and osteoporosis.

II. Traumatic (cyphose hereditraumatique, Kummel's disease).—The traumatic type was first described by v. Bechterew and Marie, who believed that the tendency to develop ankylosis of the spine after injury showed an inclination to run in families, and who therefore proposed the name hereditraumatic kyphosis.

The cases fall into two groups, which, however, show some tendency to run into each other. In typical cases of one group there is a history of a fall on the feet or on the buttocks or shoulder. The patients are usually confined to bed for a short time and when they rise feel little the worse. A few weeks later it is noticed that the back is bending and becoming stiff and the process gradually extends until the entire spine is a solid rod. The joints of the limbs are not affected unless injured at the same time. There is less tendency to extreme kyphosis than in the rheumatic form. Examination shows no point of injury in the spine, no angularity, and no tenderness over particular spines or nerve roots. The other type generally follows a blow on the back and the period of absence of symptoms does not occur. The history is otherwise much the same, but examination discloses an angularity or prominence in some part of the spine and here there is tenderness over or alongside the vertebra. The name of Kummel is especially associated with this type.

Pathologically the groups resemble each other closely and the changes have been studied carefully by Reuter (Archiv für Orthopädie, 1904, ii, 187), who finds that the primary lesion is a rupture of fibers in the intervertebral discs and in the bodies of the vertebrae. This is followed by production of callus which renders the disc inelastic and by interfering with the motion of the spine causes a tension upon all the ligaments and pressure upon the small joints which may have been also injured. The constant irritations and friction causes ossification of the ligaments which may include the capsule of the articular processes. This interferes still further with motion and reacts on neighboring vertebrae in the same way and thus the process spreads until the whole spine is involved. Specimens show at one place a deformity and partial ossification of one or more intervertebral discs, an ankylosis of the joints of the articular processes and of the heads of the ribs and ossification of the ligamenta flava and interspinalia. If the injury was severe and particularly in the second group there are often bridges of bone extending over the edge of the disc and connecting the bodies of adjacent vertebrae. In this case the disc is found thin and atrophic or bulged out, so that it extends beyond the line of the vertebrae.

III. Rheumatic (chronic rheumatism of the spine).—Almost all the cases of this group have a history of acute rheumatism or gonorrhea, and all seem to be infectious in nature. There is usually a typical attack of acute rheumatism involving several of the large joints and perhaps passing away without leaving any permanent changes. Soon after, however, the spine begins to stiffen, and the stiffness either extends gradually along the entire column or may stop after involving only a few vertebrae, in which case the remainder of the spine is often affected during subsequent attacks. In most cases there is permanent loss of function in some of the

large joints and a marked tendency to fibrous ankylosis with deformity of the fingers and toes. Rarely the spine and many of the joints were permanently disabled in a single acute attack resembling Still's disease. The cases of ankylosis between occipital bone and atlas and axis are probably rheumatic, although Regnault and Poncet (Société Anatom. de Paris, 1900, 691) claim for them a tuberculous origin.

In cases following gonorrhea some of the large joints are ordinarily affected first, but the spine may be involved first or alone. The process usually begins below and spreads rapidly upward.

The nervous symptoms are less marked than in cases of osteoarthritis. There is pain in the affected joints and in the spine, which may pass away as rigidity becomes complete. The reflexes are increased, but paresthesia and shooting pains are not common, although more frequent in the gonorrheal cases. There is frequently atrophy of muscles around disabled joints or contractures causing marked deformity. The joints at the root of the limbs are more frequently involved than any other, whence the name proposed by Marie (Revue de Médecine, 1898, xviii, 285) of rhizomelic spondylosis.

As regards the pathology of these cases the only constant condition is ankylosis of the joints of the articular processes. The ligaments are usually ossified, at least in the kyphotic portions of the spine. The discs are frequently atrophic in the dorsal region, and then the bodies of the vertebrae may be united by lateral bridges. We may find small button-like exostoses over the discs, especially if the anterior common ligament is ossified, but there are none of the large osteophytes which characterize osteoarthritis. The cord is never altered, but in a few cases the muscles of the spine were found to be fatty.

IV. *Osteoarthritis* (arthritis deformans and rheumatoid arthritis of the spine).—In this group all those cases may be placed in which there is bony deformity of joints or large osteophytes. It is further characterized by the constancy of nervous symptoms, either sensory (pain, paresthesia, hyperesthesia, etc.) or motor (muscle atrophy, rigidity, fibrillary twitching, etc.). Ordinarily the onset is gradual and no cause is known, although some cases are ascribed to trauma and syphilis. In most cases one of the large joints is first affected. There is deformity with limitation of motion and grating and pain. Soon after it is noticed that the back is becoming stiff and at the same time shooting pains in the limbs are experienced and atrophy of muscles is noticed. More rarely the spine is first affected. Deformity is usually extreme and the course chronic throughout, for which reason the name "chronische ankylosirende Entzündung" has been proposed for it. Examination shows deformity and limitation of various joints, atrophy of muscles although no reactions of degeneration, marked kyphosis and rigidity and atrophy of the spinal muscles, tenderness over spinal roots and exostoses over the sacroiliac joint or on palpation through the pharynx on the anterior surface of the cervical vertebrae. The lesions of the spine are not as well known as those in the large joints, in which the process begins by erosion of cartilage which differs from that of the rheumatic type which is found around the

edge of the articular surface where the synovial membrane is attached, in that it occurs at the point of greatest pressure. This is followed by overgrowth and deformity of the articular surface and of the end of the bone, often associated with atrophy of the bony tissue in one part and eburnation in another. In the spine the process begins as a growth of flat osteophytes around eroded articular surfaces and when the process is advanced the joints are completely ankylosed. Vegetations, stalactites, osteophytes and exostoses are found in various parts but mostly on the anterior surface of the bodies and around the articulations of the ribs. The ligaments are ossified here and there and the transverse and spinous processes are often deformed. Osteophytes frequently partly occlude the intervertebral foramina, leading to atrophy of nerve roots and of the cells in the posterior columns of the cord.

V. *Nervous*.—In a few cases lesions of the central nervous system have been demonstrated and in several others it is doubtful whether the bones of the spine were affected, the loss of mobility being apparently due to disease of the erector spinæ muscles. In many cases such a condition seems to have preceded bony or articular lesions. The nature of the nervous lesion in these cases is not clear. Syringomyelia may involve the spinal as well as other joints, but no case of complete rigidity has been reported in which this was clearly the cause. Several of the most typical cases of this group exhibit a history of injury and v. Bechterew (Neurologische Zentralb., 1893, xii, 426; Deutsch. Zeit. f. Nervenhe., 1897, xi, 327), who first described the condition, believed that it was always initiated by trauma. In one of his cases (Deutsch. Zeit. f. Nervenhe., 1899, xv, 45) degeneration of the posterior ganglia and roots was found. Rigidity was due to loss of power in the spinal muscles and local atrophy of the intervertebral discs, with union of the vertebral bodies by lips of bone from the edges. The arches and articular processes were not affected. Sachs and Fränkel (Jour. of Nervous and Mental Diseases, 1900, xxvii, 1) found syphilitic meningitis in one of their cases. The only constant lesion is atrophy of the muscles of the spine and sometimes of those of the limbs. There is weakness of various muscles, with atrophy and often fibrillary twitchings. The kneejerks are accentuated. Paresthesias are frequent; burning and tingling and shooting pains. The disease begins early in life and frequently in syphilitic subjects. Other joints are usually free, although the shoulder and hip may be diseased. Kyphosis is extreme.

If there is a disease *sui generis*, it forms part of the nervous group, but as so few autopsies on cases of this sort have been reported it is impossible at present to affirm the existence of such a disease.

All the case reports published have been studied and the cases, autopsies, and anatomic specimens have been arranged in groups as follows. The list is given in chronologic order, and each name is preceded by the date in parenthesis and by the number of cases which is found classified in the list following:

(1833) Clutton, 1; (1875) Leyden, 2; (1877) Lancereaux, 3; (1879) Sturge, 4; Russel, 5; (1882) Nolen, 6; (1883) Bradford, 7, 8, 9; (1886) Mancini, 10; (1887) Koehler, 11;

(1891) Amaral, 12; (1893) Thanassesco, 13; Bechterew, 14, 15, 16, 17, 18; (1895) Müller, 19; Kümmel, 20; Hahn, 21; (1897) Heidenhain, 22; Kirsch, 23; Vulpius, 24; Staffel, 25; Bechterew, 26; Marie and Astié, 27; Bruck, 28; Strümpell, 29; Beer, 30, 31, 32; (1898) Schataloff, 33, 34, 35; Suñol, 36; Spillman and Etienne, 37; Ascoli, 38; Feindel and Froussard, 39; Baccelli, 40; Marie, 41, 42, 43, 44; Hattemer, 45, 46; Jacobi and Urardi Beckman, 47, 48; Baumler, 49; (1899) Popoff, 50; Zenner, 51, 52, 53; Sanger, 54; Schültze, 55; Goldthwait, 56, 57; Jacksch, 58; Hoke, 59; Heveroch, 60; Bechterew, 61; Menko, 62; Bechterew, 63, 64; Lichtheim, 65; Hoffmann, 66; Bregmann, 67; Damsch, 68; Meyer, 69; Schwalbe, 70; Valentini, 71, 72; Dana, 73, 74, 75; Gasne, 76; Raymond, 77; Korchgaesser, 78, 79, 80, 81; Renauld, 82; Müller, 83; Senator, 84; Leri, 85; Schulz, 86; (1900) Hoffa, 87; Waldmann, 88; Levi and Follet, 89; Kollarits, 90, 91, 92, 93, 94; Frazier, 95; Lichtheim, 96; Glaser, 97; Hartmann, 98; Eshner, 99; Potts, 100; Sachs and Fraenkel, 101, 102, 103, 104; Achard and Clerc, 105; Leugnet, 106; Leipziger, 107; Glaser, 108; Schlesinger, 109, 110, 111; Dorendorf, 112, 113; Auerbach, 114; Cantani, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124; Steffensen, 125; Rostoski, 126; Heiligenthal, 127-131; (1901) Borchard, 132; Wagner, 133, 134, 135; Bender, 136; Lauenstein, 137; Anschutz, 138-147; (1902) Cassirer, 148; Ostankoff, 149, 150, 151; Kedzier, 152-159; Markiewicz, 160; Brauer, 161; Kruger, 162; (1903) Focken, 163-168; Zesar, 169, 170, 171; Siven, 172, 173, 174; (1904) Voltz, 175, 176; Claisse, 177; (1905) White, 178; Ossepoft, 179; Schaykewitsch, 180; Guffey, 181.

Cases reported with autopsy: (1877) Fagge, 1; (1878) Plogey, 2; (1897) Baümler, 3; (1898) Ascoli, 4; (1899) Leri, 5; Milian, 6; Marie, 7; Bechterew, 8; (1901) Glaser, 9; (1902) Reuter, 10; Weigel, 11; (1903) Liven, 12; Pie de Villiers, 13, 14; (1904) Frankel, 15, 16, 17, 18.

Specimens described: (1856) Wood, 1; (1869) Virchow, 2; (1877) Jackson, 3; (1895) Marsh, 4; (1897) May, 5; (1898) Marie, 6; (1899) Leri, 7; (1900) Schlesinger, 8-14; Regnault, 15-19; (1901) Lowenstein, 20; Heinlein, 21; (1902) Reuter, 22; (1905) Ehrhardt, 23.

These cases may be divided into five groups:

Senile: Specimens, 14, 21.

Traumatic: Cases 5, 10, 15, 16, 19, 20, 21, 22, 23, 24, 25, 26, 27, 34, 45, 46, 57, 71, 98, 109, 110, 115, 132; 133, 134, 135, 137, 142, 149, 162, 173, 175, 176, 180, 181; autopsies, 16, 17; specimens, 3, 13, 22.

Rheumatic: 49, 52, 63, 64, 88, 127, 146, 153, 158, 178; with history of acute rheumatism, 1, 3, 9, 13, 36, 40, 50, 65, 70, 72, 73, 80, 81, 83, 84, 99, 104, 107, 112, 113, 125, 126, 129, 140, 143, 145, 157, 169, 171, 180; with history of gonorrhea, 4, 6, 7, 8, 12, 31, 44, 51, 65, 77, 80, 82, 85, 111, 112, 113, 114, 116, 128, 139, 144, 149, 154, 169, 170, 179; no history of infection, 29, 37, 63, 64, 69, 76, 78, 101, 102, 118, 124, 136, 138; with history of tuberculosis, 97, 101; with history of syphilis, 38, 40, 61, 102, 124; probably Still's disease, 126, 147; upper cervical spine only, 58, 59, 117; autopsies, 5, 6, 7, 9, 15, 18; specimens, 7, 8, 20, 23; specimens of upper cervical, 1, 16, 17, 18, 19.

Osteoarthritis, 11, 37, 41, 42, 47, 48, 62, 75, 101, 108, 120, 121, 129, 130, 144, 152, 159, 172; autopsies, 1, 2, 4, 10, 12, 13, 14; specimens, 2, 4, 5, 6, 9, 10, 11, 12.

Nervous: Cases 2, 14, 17, 18, 26, 30, 32, 33, 39, 43, 53, 56, 61, 66, 67, 74, 79, 89, 99, 100, 103, 105, 119, 129, 148, 155, 161, 173, 177, 180; autopsies, 3, 8.

Pott's disease and other conditions not included here: Cases 28, 35, 54, 55, 60, 68, 87, 96, 101, 106, 131, 141, 156, 160.

REVIEW OF LITERATURE.

Typhoid Cholecystitis.—Doerr¹ reports an instance of such a condition. When the patient came to him she gave a history of having had an attack of some fever before the onset of the present trouble with the gallbladder and also a history of having attack of colic pains which radiated toward the region of the shoulder six years before the patient came under his care. At the operation he found empyema of the gallbladder, from the pus of which spreads were made and when stained were found to contain bacilli which, with animal experimentation, by cultural methods and by the agglutination test, were found to be typhoid organisms. The calculi discovered in the gallbladder also contained similar bacteria in pure culture. Doerr found by experimentation that if guineapigs were injected intravenously with bacteria the microbes soon appeared in the bile and in the stomach, but if injected subcutaneously or intraperitoneally they did not reach the bile. He also found that *Bacillus typhosus*, paratyphoid, colon and dysentery bacilli grew in the bile months after the injection or long after the bacteria had disappeared from the blood stream. [J.F.]

The Diagnostic Value of Sound Conduction in the Lung.—R. von Velden² recommends the following modification of auscultatory percussion, when listening to lung sounds. He listens to the lung sounds at the back, while an assistant performs percussion in the front of the chest. The method of percussion is finger to finger percussion performed quietly in an intercostal space. He claims a number of advantages for this method. [E.L.]

New Explanation of the Reduplication of the Second Sound in Mitral Stenosis.—The classic explanation of the reduplication of the second sound in mitral stenosis has been that of an asynchronism in the closure of the aortic and pulmonary valves. L. Gallavardin³ does not believe that a special phenomenon of this order can be explained by so common an occurrence as a difference in the blood tension of the systemic and pulmonary circulations. He maintains that the first of the two sounds is caused by the closure of the aortic and pulmonary valves, while the second is an adventitious sound produced by a diastolic vibration of the mitral valve. At the moment of closure of the semilunar valves there is produced a concussion at the aortic orifice; this concussion occurs not only in the aortic ring, but also in the intraventricular blood, by reason of the forcing of the valve leaflets into the ventricular cavity. This concussion is transmitted to the larger leaflet of the mitral valve, which is set in vibration. Under normal conditions no sound is produced. But in mitral stenosis the orifice is narrowed, the edges of the leaflets are indurated, and the vibration is sufficient to force the larger leaflet against the smaller one, producing the valvular sound that is heard immediately after the normal second sound. This explanation seems the most rational for several reasons: 1. It localizes at the site of the lesion the origin of the reduplicated sound. 2. It explains why the reduplication occurs only in mitral stenosis. 3. The character of the sound is explained, together with its variations in the diverse cases of mitral stenosis. 4. It explains the absence of reduplication,

¹ Wiener klinische Wochenschrift, No. 34, 1905.

² Deutsche medizinische Wochenschrift, 1905, xxx, 581.

³ Lyon Médical, September 10, 1905.

when the stenosis is associated with mitral or aortic regurgitation. [B.K.]

A New View of Sleep.—A. K. Bond¹ coins the word "awakeness" to signify the state of being awake, which he asserts is the abnormal state of man, the simple primal condition of animal existence being sleep. This reverses the usual belief which Bond regards as a faulty viewpoint. The human body and brain are originally molded in sleep. From this state man gradually changes until two-thirds of the day are spent in the unnatural condition of awakeness, yet even in full manhood it is with a sigh of relief that daily toil is laid aside for sleep. The whole of plant life is identical with our state of sleep. Dreaming, hysteria, the hypnotic state, insanity, and some types of insomnia represent stages of partial sleep. The phenomenon of awakening is discussed, no part of it being more mysterious than that of awakening at a time determined upon before sleeping; this leads to the supposition that there is a higher part of man which never sleeps. [A.G.E.]

Gastric Tetany.—Edenhinzen² reports a case of gastric tetany dependent upon an attack of acute gastritis in a woman of 34. There was obstinate bilious vomiting but no jaundice. Examination showed only gastropnoctosis. Spasms in the limbs followed the passing of the stomach-tube in many instances. The electric reactions showed that the early attacks were genuine, the later, pseudotetany. The constant dependence of attacks upon gastric irritation shows that it was true tetany. None of the theories of pathogenesis fitted the case well, but that of auto-intoxication was favored by the presence of acetone and a trace of albumin in the urine. [T.S.G.]

Clinical Examination Concerning the Viscidity of the Blood in Disturbances of Carbonic Acid Excretion.—J. Bence³ found that the viscosity of the blood rises and falls with its amount of carbonic acid. This connection is brought about by the changes which the red corpuscles suffer in size and surface appearance under the action of the acid. This relation can also be noted in the blood contained in the circulatory stream. An excess of carbonic acid in the blood injures the heart through the increase in viscosity. Should the excess of carbonic acid be due to an insufficiency of the heart it will in time induce a slowing of the rapidity of the blood flow. Oxygen inhalations diminish in suitable cases the viscosity of blood by favoring the excretion of carbonic acid. Cardiac insufficiency therefore can be more or less improved by oxygen inhalations. He could not produce a distinct change in the viscosity by rearranging the diet of patients. [E.L.]

The Circulatory Apparatus in Acute Infectious Diseases.—Schmaltz⁴ says that every infectious process is capable of affecting the circulatory organs, and in varying degree. In the case of the heart, it is usually an organic change in the heart muscle that plays the most important part. The changes that occur in the febrile period are well known, but little attention has been paid to those of convalescence. In some cases the pulse, instead of falling with the temperature, becomes slower even while there is fever; or it may fall suddenly after fever has been absent for several days. This bradycardia occurs oftenest in diphtheria and scarlet fever. In other cases a rapid pulse may occur during convalescence, often associated with a great degree of variability. Disturbances of the rhythm are frequent. Murmurs may appear during the febrile period, and may persist in some cases for a long time. Dilatation of the heart occurs frequently during fever, but is more frequent in the convalescence from infections than is ordinarily supposed. It may be transitory and give rise to no symptoms, or it may persist for some time after convalescence. In diphtheria, especially, it sometimes gives rise to serious

symptoms and even death. These cardiac phenomena are to be regarded as signs of disease of the heart muscle and are not endocarditic or functional, as formerly supposed. They may develop even after the patient is apparently entirely well and has resumed his ordinary occupation. In articular rheumatism and septic infection, the endocardium and pericardium play a much more important role than the heart muscle. [B.K.]

Value of the Cradle.—John Zahorsky¹ says the cradle in the nursery is a hundred times less objectionable than the modern devices which have been forced in place of it. The baby is now rocked on its mother's knee, carried, or laid in a crib and quieted by tapping on the back or rubbing the abdomen; the motions are increased instead of diminished by these substitutes for the soothing motion of the cradle. Two things have materially contributed to the unpopularity of the cradle: 1. The study of infants in asylums and hospitals where cradles are not necessary; but children in private homes are not to be judged by foundlings. 2. Increased knowledge of the physiology of infants; but here the pediatricist has spoken beyond his knowledge. Zahorsky urges the return of the cradle to the nursery, especially where no nurse attends the baby. [A.G.E.]

The Parathyroid Glands in Graves' Disease.—L. Humphry² says that there seems to be some association between the acutely fatal cases of Graves' disease and lesions of the parathyroid glands. In animals the removal of these glands alone will produce the following course of symptoms: tremors, a slow and unstable gait with contractures of the limbs, emaciation and muscular weakness, tachycardia, vomiting and diarrhea, scanty urine with albumin, dyspnea, tetany, convulsions and death. The author reports two cases of Graves' disease which ended fatally with acute symptoms. In both cases the thyroids showed those changes typical of the disease, while the parathyroids showed extensive infiltration of fat. Microscopically there was found an atrophy of the normal parathyroid tissue and its replacement by fat. In 18 cases of death from other causes the parathyroids exhibited their normal structure, as described by Welch. The evidence is still insufficient upon which to base a definite association of the acute form of Graves' disease with lesions of these organs; but the opinion is gaining ground that these are independent structures, and not accessory thyroids, as was at first supposed.

Measles in Aberdeen.—G. N. Wilson³ furnishes a most exhaustive article, accompanied by several charts, giving the statistical features of measles in Aberdeen during the past 20 years. During the last 10 years the disease has increased, though this is partly due to increased efficiency in notification. The epidemic periodicity is chiefly biennial, though sometimes triennial. Epidemics of measles and whoopingcough alternate with considerable regularity. The annual and the case mortality have both fallen markedly during the period considered. The case mortality is by far the highest during the first and second years of life, and highest of all in the fourth quarter of the first year; it is therefore of great importance to protect children from the disease during those years. [A.G.E.]

Symptomatology of Infarcts of the Spleen and Kidneys.—Infarcts of the spleen and kidneys may occur in the course of heart disease, without giving rise to any symptoms. In other cases the most varied clinical pictures may be caused by them. G. Riebold⁴ reports a case and reviews the literature. Infarcts of either organ may give rise to a severe, overpowering, localized pain, lasting for some time, and gradually disappearing. The onset may also be marked by severe symptoms resem-

¹ Maryland Medical Journal, October, 1905.

² Archiv für Verdauungs-Krankheiten, Band xi, Heft 4.

³ Deutsche medizinische Wochenschrift, 1905, xxx, 590.

⁴ Deutsche Archiv für klinische Medicine, Bd. lxxxv, p. 10.

¹ St. Louis Medical Review, October 21, 1905.

² The Lancet, November 11, 1905.

³ Public Health, November, 1905.

⁴ Deutsche Archiv für klinische Medicine, Bd. lxxxiv, p. 498.

bling intestinal obstruction or peritonitis, namely, collapse, vomiting, meteorism, constipation, retention of urine. Sometimes a moderate rise of temperature and a leukocytosis may occur. In some cases the hyperalgesic cutaneous areas, demonstrated by Head as corresponding to disease of the various internal organs, may be found, and may serve as an aid to diagnosis between infarct of the left kidney and of the spleen. Enlargement of the spleen and friction phenomena in that area are evidences of splenic infarct. In renal infarct there may occur oliguria or anuria, hematuria and albuminuria; but extensive lesions may occur in both kidneys, without producing any abnormality in the urine. In the case reported, the probability of embolism of the renal and splenic arteries was supported by the occurrence of embolism of the basilar artery, with symptoms of acute bulbar paralysis. [B.K.]

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The advantages of skillful pharmacy seem to be overlooked in the present outcry against proprietary mixtures sold under trade names. In an address at the Boston Medical Library meeting Dr. Frank Billings,¹ of Chicago, stated that nearly half of the prescriptions written in Chicago and Boston call for such trade mixtures not found in the Pharmacopeia; in New York it is 70%. These articles evidently fill a need and it is time to inquire whether the majority of the medical profession is wrong or whether the Pharmacopeia is defective. It must be remembered that for 50 years the official Pharmacopeia occupied a secondary place—indeed, it was a flat failure so far as filling the needs of the practical doctor. The commentary upon it, the Dispensary of Wood and Bache, first published in 1833, and intended as a therapeutic work to popularize it, practically displaced it. About 30 years ago began the modern movement to keep the official Pharmacopeia up to date by eliminating things which the profession had ceased to use and introducing things it had found to be valuable. Of necessity, then, it is a record of progress—always behind the times and never in advance of them. The profession is constantly on the alert for remedies of greater value than the ones found disappointing—it must use everything which laboratory or other experimentation proves to be useful.

There is a constant evolution in drugs, untold thousands of which are taken up, laid aside as a rule, and the few useful ones survive to be incorporated in the official list in time as orthodox. Progress means heterodoxy or the use of things not orthodox. He who uses only those things known to be orthodox is therefore just that far behind the times and he is likely to fail, because he does not use things found to be valuable but not yet stamped as official. The first few patented synthetic compounds of value, beginning with antipyrin, practically revolutionized professional ethics in 1884, for they

compelled the up-to-date physician to use what was formerly condemned on principle. A few bold teachers set the pace and defiantly announced that they would use what was known to be beneficial to their patients, whether it was patented or not, in or out of the Pharmacopeia, if they knew what it was and where to get it unadulterated. There was much ill-feeling, and there was an uncertain dread among the conservative that we were undermining our foundations, but it turned out that we were only repairing them stone by stone. In advocating the use of patented mixtures, whose secret composition can be obtained for a small fee, Dr. Billings is taking a step which would have been severely condemned 25 years ago, but the quiet acquiescence of the profession in this matter shows that it has progressed far beyond the position it took upon the appearance of the synthetic compounds. It now demands prepared mixtures and the majority use them. It needs no prophecy to state that such things as are approved by Dr. Billings must become orthodox by incorporation in the Pharmacopeia or it will fail to record progress and tell what is being used by the profession. It will sink to the position it held in the first half century of its life.

Condemnation of unpatented proprietary mixtures does not seem logical. Of course no physician of sense will prescribe secret things whose composition he does not know, but once knowing them, he cannot be expected to remember the exact proportions. Not one physician in a hundred can tell the exact composition of paregoric—he does not need to if he knows its exact effects as a mixture. It was once a proprietary mixture—practically speaking if not literally so—and became orthodox because it was used by the majority of the profession, and they used it because it proved to be a good mixture. Other useful mixtures are now going through the same process as paregoric, and we are quite sure that Dr. Billings in condemning them is not voicing the opinion of the progressive element of the profes-

¹Journal American Medical Association, January 20, 1906.

sion—and that is the great majority; nor are we sure there is so much danger in them as a few writers are inclined to believe. If they are inethical, so are the patented ones; indeed, we seem to be losing our bearings when we approve patented things and disapprove those not patented. We can use them without countenancing the dreadful nostrums, nor indeed need we touch the borderland articles which so often are nostrums masquerading with ethical clothing. We are in another period of a revolution in our attitude toward new drugs, and it is the part of wisdom to heed it if it is to be ethical.

The demand for good pharmacy is at the basis of the present trend of the profession. There are good reasons for the decline of the old-fashioned prescription writing. The schools are not wholly to be blamed for neglect—they merely voice the opinion and usage of the profession. Indeed, they are not always in the advance, for the great pioneers are too often the outsiders, like, Koch. Pharmacy is an art and science of itself, as we have previously observed, and a good doctor cannot become a good pharmacist without neglecting more useful things. It is generally recognized that experts can make better mixtures than can be made by the old style extemporaneous prescription which so many still advocate. The old profession trusted the small druggist, the new is trusting the large manufacturer, and one is as trustworthy as the other, no more and no less. The vast majority of the profession are filling their offices with ready-made tablets, pills and various mixtures, and are harking back to the old days when all doctors dispensed their own drugs. It is an evolution brought about by the growth of modern expert pharmacy. To be sure, they are imposed upon now and then, just as the older physicians were by fraudulent substitutions in the corner drug store. We do not condemn prescription-writing for that reason, though we should—to be logical—if we condemn the new methods.

The profession wants the most elegant preparations it can get and will get them. And they are inclined to trust the firms having large interests at stake which would be jeopardized by misstatements or substitutions. They demand advertisements, for in no other way can they learn of new things—the Pharmacopeia does not tell them. If a medical journal is to restrict its columns to merely the old—that is, if it becomes purely official and orthodox—there's an end to progress. Heterodoxy or progress demands the new and as yet unofficial. When it is satisfied the unofficial becomes official. Physicians must not be treated paternally, as though they were thoughtless babies. They do a heap of thinking and in the end generally force the leaders to be fol-

lowers. Schools teach what the profession is doing. They will bitterly resent any accusation that they do not practise rationally, make no diagnoses, merely noting symptoms and treating them—a drug for each one. They demand full information on the new and are not satisfied with secret compositions on the one hand or the orthodox on the other. If officialism is to keep them in darkness as to progress they will have none of it, but will become protestants on principle. The religious nonconformists have just upset the British government by a stupendous but bloodless revolution—medical nonconformists can do the same if need be—and indeed the revolution is now on if 70% are insurgents already.

Ridiculous trade names will correct themselves in time. The manufacturers need a word of kindly advice. It is true that the barbarous chemical names given to new synthetic compounds are so ridiculously impractical that physicians demand shorter ones. It is equally true that the official titles of the Pharmacopeia are impractical for colloquial use. The “nicknames” are universally used, such as paregoric and laudanum. In neither case is there excuse for the bizarre and almost flippant catchwords generally invented for new pharmaceutical mixtures. They have so often been the means of concealing composition and have so misled—innocently, sometimes, no doubt—as to have cast great discredit upon really useful combinations. A word to the wise is sufficient.

Eclecticism has had its basis in an alleged disposition of the regular profession to reject new and useful things because they are unorthodox. There is a widespread opinion among laymen that regular physicians are too hidebound to keep up with the times. It is a false opinion, of course, but it is played upon by every eclectic who gives the impression that he is the only rational therapist among them all, whereas scientific medicine uses everything known to be useful. If prayer will soothe a poor hypersensitive neurasthenic, he's a brute who will not recommend it in appropriate cases, as advised by an English physician; but prayer is not in the Pharmacopeia, and it is proprietary to a certain extent in the minds of the ungodly. The present discussion is giving ammunition to every eclectic in the land who will advertise that he is using useful proprietary mixtures of known composition which are condemned as unorthodox by certain regulars. The profession needs to be protected from too much officialism and officiousness—always has had need and always will. It clings to its Aryan rights of free thought, free speech, free uncensored press, and freedom to do what's right. Any other course will be fatal to that organization which

is such a crying necessity to represent every unit in the profession instead of a disintegrating autocracy.

A Neglected Field in Medical Teaching.—Advances in knowledge are so rapidly widening the medical horizon that the construction of a properly balanced curriculum is to those in charge of medical colleges a most serious problem. In addition, the professor in charge of each branch finds difficulty in choosing from the almost exhaustless material at his command that which is of most value to present in the limited time at his disposal. Largely because of this disparity between material and the time for its presentation, each teacher concentrates his attention upon the points pertaining to his subject. This to a degree is eminently proper, but partly from necessity and partly from choice this concentration is too often made excessive. The head of each department attempts to make of the students under him specialists in that branch; at least if such attempt be not consciously made, the teaching imparted tends mightily in this direction. As a consequence one or both of two results is almost inevitable. First, the importance of a branch is exaggerated and its relation to other branches is correspondingly minimized. Each subject is thus presented in an isolated and somewhat overdrawn manner and the student must needs compare and correlate them, a task which the exceptional man may accomplish but for which the average medical undergraduate is entirely unfitted by previous training, and for which he has neither the time nor the inclination. Second, the practical side of the subject is subordinated to the scientific aspect. Concretely, learned discussions that would be appropriate for teachers of the branch are given to the higher classes or even to sophomores and freshmen as lectures. Well-rounded, accurate, critically summarized presentations of the subject though these may be, they go over the heads of the students just as surely as though delivered in Greek to men unfamiliar with that language. Enthusiasm leads to lack of balance, the teaching specialist being as prone to this condition as is the practising specialist.*

Correlation in Teaching is Desirable.—Instead of departmental heads seeking each for more hours to devote to his special branch, the present need is rather for concerted effort in adapting the teaching of each to that of the others. The relations between the various branches, their interdependence, and above all, the way in which the principles of each explain and clarify the facts in the others, are of prime importance. And these must be taught to the student, just as the primary facts are taught, or he will not grasp them. Teach him the fundamentals of each branch and help him properly to cor-

relate one with the other and the intricate experiments, academic discussions, and latest theories pertaining to each, as so often detailed in lectures, may safely and profitably be omitted. Right in line with this idea is the suggestion of Dr. W. S. Hall¹ regarding pathologic physiology. His belief is that the relations between physiology and pathology are not satisfactorily brought out. He would give to students who are taking clinical medicine and surgery a course demonstrating the relation between symptomatology and pathology. Diagnosis and therapeutics both should be tabooed, the entire attention of instructor and students being directed to solving problems of modified function as related to modified structure. A successful teacher of this subject must needs be well versed in physiology, pathology, and clinical medicine. An appropriate manual of such instruction is needed, as no satisfactory work is now published. The preparation of such a manual and the institution of the outlined course are considered by Dr. Hall the most urgent needs of medical pedagogy. Whether a separate course can be made feasible or not, the suggestion is most timely, and coming as it does from a progressive and practical teacher of physiology, it deserves very careful consideration. We believe that in this or in some other way means can be devised profitably to eliminate certain of the undesirable accompaniments of specialism in medical teaching.

Deaths in the Ranks During 1905.—The annual summary of deaths of physicians in the United States and Canada² shows that during 1905 there was a total of 2,045, as compared to 2,142 in 1904, a rate of 16.36 per 1,000. This differs but little from the rate for preceding years, though slightly less than in 1904. As before, "heart disease" is the most frequent cause, with 203 cases. Cerebral hemorrhage 153, and pneumonia 141 cases follow in frequency. Accidents number 72 as compared to 95 in the previous year. Suicides were 46, instead of 36 in 1904. Malignant disease claimed 34 victims. Insanity was the ascribed cause in 6, as compared with 11 in 1904. Of the entire number 254 were Civil war veterans; 167 were members of the American Medical Association. Deaths in the medical department of the army, past or present officers, were 35; in the navy 21, and in the Public Health and Marine-Hospital Service 2. The data regarding many of the deaths were incomplete, although there was in this respect improvement over 1904. For the two years the instances of lack of explicit cause of death were respectively 706 and 954; age, 284 and 421; years of practice, 105 and 288.

¹ Journal of the American Medical Association, December 30, 1905.

² Journal American Medical Association, January 6, 1906.

This is a decided gain in accuracy, but there is yet much to be desired. The biographic card index now being completed by the *Journal* will undoubtedly prove of service in this as in many other matters of interest to the profession at large.

For an Improved Street Car Service—The recently announced determination of Director of Public Health and Charities Coplin to secure improvements in the street car service in Philadelphia should be promptly seconded by the people of the city. The Rapid Transit Company has too long profited by political misrule and lack of competition to be amenable to anything but persistent and vigorous enforcement of the laws to which the corporation is actually subject. In pursuance of the plans of the department, inspectors of the Bureau of Health are to report upon the unsanitary condition of the cars in use, infractions of the law against spitting therein, and the running of flat-wheeled and in other ways noisy cars. The traveling public is also asked to report in detail to the bureau instances of these violations; it is very desirable that this request for information be given personal attention by every patron of the company. In this way may be collected a mass of evidence that will warrant proceedings against the company under the new health laws of the State, which are believed to confer the necessary authority. Of those who use the cars, physicians especially can furnish valuable aid in this matter. The daily press of the city should keep the question before the people. Director Coplin's management of affairs at the Almshouse is sufficient evidence of his ability to do things. Let the people of Philadelphia hold up his hands in this matter of street car service and if his department possesses the power they will witness the amelioration of conditions against which for years they have vainly been expostulating.

The warfare on mosquitos is to be carried on more vigorously than ever, and various associations, big and little, are being formed for concerted action. It is now known that the evil is more or less remediable, but that the remedy is quite expensive. Treating vast areas with oil to destroy the larvas has not apparently been as successful as was at one time hoped and it is not a cure anyhow. The present plans are in the direction of draining or filling in the breeding places—a stupendous undertaking, but well worth an effort at least. Great territories now nearly uninhabitable might become healthy and the made land might partly repay the cost. The State of New Jersey is to be asked to appropriate \$350,000 for the purpose in accordance with the plans of State Entomologist Jno. B. Smith. In New York even more extensive plans are in preparation. Following the

example of Dr. Langford, of San Antonio, it is proposed to interest boards of education, to the end that the 10,000,000 school children of the country will become coworkers. The extermination of mosquitos is, of course, not possible, but it is possible to destroy the breeding places situated near towns or near individual houses. An enlightened public opinion is needed, and the school children will soon bring that about if they are given practical instruction. It is just the kind of work which interests them and will bear good fruit as soon as they grow up, if not at once. The whole movement suggests possibilities of a great reduction in sickness and deserves the active support of the medical profession. We might indeed be able to make yellow fever a negligible factor. In New Jersey it is proposed to hold the landowner responsible for the mosquito nuisance, and that if he does not abate it the work is to be done by public officials after legal action.

The logical basis of the sanitary policy of mosquito reduction was described by Sir Ronald Ross in an address published in *Science* December 1. It is shown mathematically that if the area of extermination is small, there may not be any appreciable reduction, as the mosquitos migrate in from surrounding territory. If the size of the area is larger than the migrating power, the center may be mosquito-free, but not the outer parts. Moreover, effective work is a benefit to a small zone around the exterminated areas, because its mosquitos are diminished in number from migration to the central districts. The matter is quite comprehensively treated, but it is shown by State Entomologist Smith (*Science*, January 19, 1906) that Ross' conclusions do not apply to some culex species in New Jersey, which migrate long distances for some other purpose than finding food or breeding places. The dominant species in the Orange Mountains have their breeding places on Staten Island. Work in the Newark meadows materially reduced the mosquito pest in Paterson, some miles away. These facts show that the crusade is not a local matter at all, for one county may suffer from the neglect of another. It may even be more than a State matter.

The New United States Pharmacopeia makes many changes in the strength of drugs and preparations, reducing some, increasing others as much as double. The law recognizes the current United States Pharmacopeia as the standard. To avoid accidents and damage suits on the one hand, and puzzling lack of results on the other, both the druggist and doctor must follow the same standard. As a convenient pocket reminder of these changes, Lea Brothers & Co. have issued for free distribution a carefully prepared leaflet giving an alphabetic list of the important changes. The strength of each preparation listed is given, as in both the old and the new United States Pharmacopeia.

AMERICAN NEWS AND NOTES

GENERAL.

National Quarantine.—Members of the special committee selected at a caucus of Southern Senators and Representatives have agreed on a National Quarantine bill which will be submitted to a general meeting of a delegation from the States especially interested in national legislation to diminish yellow fever. The bill incorporates many of the provisions of the Mallory bill, but instead of protecting against "contagious and infectious diseases" as the Mallory bill does the committee's measure limits the quarantine measures to yellow fever. Specific provision is made in the committee bill for the cooperation of the Public Health and Marine-Hospital Service with State authorities in establishing and maintaining interstate quarantine.

EASTERN STATES.

Boston Mortality Report.—The number of deaths reported to the Board of Health for the week is 233, as against 213 the corresponding week last year, showing an increase of 20 deaths and making the deathrate for last week 20.42. The number of cases and deaths from infectious diseases is as follows: Diphtheria, 38 cases, 4 deaths; scarlatina, 27 cases, 1 death; typhoid fever, 8 cases, 2 deaths; measles, 203 cases, 2 deaths; tuberculosis, 49 cases, 30 deaths; smallpox, no cases, no deaths. The deaths from pneumonia were 38, whoopingcough 2, heart disease 30, bronchitis 5, marasmus 4. There were 8 deaths from violent causes. The number of children who died under 1 year was 36, under 5 years, 59; of persons over 60 years, 62; deaths in public institutions, 82.

NEW YORK AND VICINITY.

To Recognize Osteopathy.—Senator Hinman has introduced a bill in the New York Legislature to regulate the practice of osteopathy. The bill gives a complete definition of osteopathy, and provides for an independent board of osteopathic examiners to be appointed by the Board of Regents on or before January 1, 1907, and to serve for three years. The board is to be under the direction of the State Board of Regents, the same as the Medical Examining Board.

Patent Medicine Restriction.—The fight for the regulation and restriction of the sale of patent medicines has been carried to the Legislature. Senator Stevens has introduced a bill regulating the manufacture and sale of patent medicines and providing for examination and analysis of them by the State Board of Health. The bill also provides for the publication on the labels, of the formula of the ingredients. It is the last provision that will arouse the opposition of the patent medicine manufacturers.

A Triumph of Newspaper Medicine.—The medical editor of one of the New York dailies used often to say that medical journalism was played out, for a journal published only once a week or once a month could never compete with the daily papers; at best it could only republish in more elaborate, if less sensational, style what the lay press had printed days before. In view of a tremendous "beat" scored by the *Sun* last week we are inclined to think the medico-lay editor was very nearly right. This enterprising journal published an interesting and circumstantial account of an operation for renal calculus performed at one of the hospitals by a wellknown surgeon of this city. All the details of the operation were graphically and, as it appeared the next day, quite accurately described. The point of special interest in the article was that the operation which it described was not performed until about 12 hours after the article had been published. "If you see it in the *Sun* it's going to be so."—[*New York Medical Record*.]

State Health Record Good.—The New York Department of Health's annual bulletin shows 137,059 deaths reported last year. In addition the returns of 175 were delayed. This made a deathrate of 17.4 per thousand population, or about the average of the last five years, against 18.2 in 1904. There was a daily average of 376 deaths, against 380 in 1904 and 350 in 1903. Pneumonia was the chief cause, being the diagnosis in 14,157 cases, against 13,531 in 1904, and 9,000 in 1903. Tuberculosis caused 10% of the deaths, 175 per 100,000. The mortality from cerebrospinal meningitis was 2,566, against 1,700 in 1904, and the average in former years, 550. Scarlet fever, after four years of high mortality, has suddenly decreased by half. Diphtheria has the smallest mortality of any year on record. The infant mortality was 27.5% of the total. There were 24,000 deaths of those more than 70 years old. Bright's disease caused 8,870 deaths. One-third the deaths in rural districts were of aged persons.

The Rockefeller Institute for Medical Research, New York, purposes to award for the year 1906-07 a limited number of scholarships and fellowships for work to be carried on in the laboratories of the Institute in New York City, under the following conditions: The scholarships and fellowships will be granted to assist investigations in experimental pathology, bacteriology, medical zoology, physiology and pharmacology, and physiologic and pathologic chemistry. They are open to men and women who are properly qualified to undertake research work in any of the above-mentioned subjects and are granted for one year. The value of these scholarships and fellowships ranges from \$600 to \$1,000. It is expected that holders of the scholarships and fellowships will devote their entire time to research. Applications accompanied by proper credentials should be in the hands of the secretary of the Rockefeller Institute not later than April 1, 1906. The announcement of the appointments is made about May 15. The term of service begins preferably on October 1, but, by special arrangement, may be begun at another time.

PHILADELPHIA, PENNSYLVANIA, ETC.

Help for Hospital Fund.—Through the assistance of W. Ellis Corey, president of the United States Steel Corporation, Braddock is to have its first hospital. He has given \$10,000, which swells the hospital fund to \$30,000, and such an institution will be opened at once. Others of the steel men repeatedly refused to take a hand in the establishing of a hospital in any part of the great Carnegie mill district.

Cumberland County Physicians' Radical Resolution.—The Cumberland County Medical Society recently adopted this resolution: "Resolved, That the Cumberland County Medical Society hereby places itself on record as favoring compulsory vaccination, and recommends that the vaccination act of 1895 be so amended as to make vaccination compulsory in children at the age of 6 months and revaccination at the age of 12 years."

War on Dirty Cars.—Director Coplin, of Public Health and Charities, has determined to wage a relentless war upon dirty street cars in Philadelphia. A rigorous investigation is to be made of the overcrowded condition of the cars and their ventilation. He calls attention to the unwholesome condition now prevailing in the street cars and directs an investigation. Medical inspectors and nuisance inspectors are to make reports, from which proper regulations for bettering the conditions are to be formulated. Reports will be made of the attitude of conductors in cases of passengers spitting in the cars. There will also be made reports of noisy, rattling cars. Complaints made by the public and sent to the Bureau will be kept on file.

Vaccination Stirs Revolt.—Threats to burn school-houses, whip teachers, and punish school directors have been the outcome of the enforcing of the compulsory vaccination law in York county, Pa. The most disrupted school system is in Springettsbury township, where there are not enough pupils in attendance to fill a schoolhouse. Out of 370 pupils the number has been reduced to 94. The teachers at the Glades have been smoked out and are holding the fort with coal oil stoves which they take to school every morning.

Measles Still Spreading in Philadelphia.—While the health authorities are not alarmed over the unprecedented number of cases of measles in the city, the utmost precaution is being exercised to deal effectively with the situation. Despite the wide prevalence of the disease there has been only one death from it since January. For last week there were reported 681 new cases. The previous week there were 656, and in the week before 718, making a total of 2,055 cases in the past three weeks. These figures do not represent the entire number of cases in the city, but only those reported to the Bureau of Health. Many cases are not treated by physicians, and hence no report of them is made. Some of these cases, however, are discovered through the nonattendance at school of the children suffering from the malady.

SOUTHERN STATES.

Smallpox Cases.—Twenty-five cases of smallpox are reported at Paw Paw, W. Va., and vicinity, 25 miles east of Cumberland. It is in mild form. Dr. McBee, physician in charge, reports 30 cases cured to date. Eight families have been released from quarantine.

Mortuary Report of New Orleans for the week ending January 27: General diseases, 34; diseases of the nervous system and of the organs of sense, 15; diseases of the circulatory system, 22; diseases of the respiratory system, 18; diseases of the digestive system, 15; diseases of the genitourinary system, 11; puerperal diseases, 4; diseases of infancy, 5; diseases of old age, 15.

Suit Against Surgeon.—To recover \$5,000, because, as alleged, he was operated on against the wishes of himself and his mother, James Ward has sued Dr. William E. Harris and the Provident Hospital and Free Dispensary of Baltimore, Md., in the Superior Court. The declaration states that Dr. Harris is the resident surgeon of the hospital to which Mr. Ward was taken for treatment on February 16, 1905. Mr. Ward was put under the influence of an anesthetic, it is alleged, for the avowed purpose of making an examination. Notwithstanding the directions of Mr. Ward and the promise made him, it is also alleged he was cut and operated on against his will and without his consent on February 25, 1905. It is alleged that the operation was unnecessary and did Mr. Ward no good, and as a result of it he suffered great pain and was incapacitated for work for a long time.

WESTERN STATES.

Ohio May Modify Capital Punishment.—The Senate has passed a bill abolishing capital punishment for persons convicted of murder in the first degree, except when the conviction shall be for a second offense. The bill now goes to the House.

Medical Society of the Missouri Valley.—The next meeting will be held in St. Joseph March 22 and 23, under the presidency of Dr. John E. Summers, Jr., of Omaha. The local arrangements are in the hands of Drs. Jacob Geiger, O. B. Campbell, and C. R. Woodson. Among those who will contribute to the program are: Dr. N. S. Davis, Jr., L. L. McArthur, and Fenton B. Turck, of Chicago; Dr. S. Grover Burnett, Kansas City; Dr. Chas. H. Mayo, Rochester, Minn.; Dr. C. O. Thienhaus, Milwaukee, Wis.; Dr. D. C. Gore, Marshall, Mo.; Dr. Prince E. Sawyer, Sioux City, Ia.

FOREIGN NEWS AND NOTES

GENERAL.

World's Hygienic Exposition.—A universal hygienic exposition will be held in Vienna May 12 to July 15 of next year, at which American firms will be permitted to exhibit. The object is to show a complete picture of the world's modern hygienic improvements.

To Disinfect City's Churches.—Archbishop Alcaron has ordered the thorough disinfection of the churches of Mexico City, to guard against the spread of the diseases which have prevailed among the lower classes during the period of extraordinary cold.

To Test Seasickness Cures.—On the occasion of the Medical Congress in Lisbon, next April, the Ligue Contre le Mal de Mer will charter a steamer which will start from Hamburg and call at Antwerp, Dover, and Cherbourg on the way to Portugal. It is expected about 600 physicians will accept invitations to sail in the steamer and test a hundred and more methods of overcoming seasickness which have been submitted to the notice of the league.

Plague at Cape Colony.—The medical officer of health of Cape Colony states that for the week ending December 23, 1905, no case of plague in man or in other animal was discovered throughout the colony except at Port Elizabeth, where out of 307 rodents bacteriologically examined two mice proved to be infected by plague. A telegram from the Governor of Mauritius received at the Colonial Office on January 19 states that for the week ending January 18 there was one case of plague and one death from the disease.

Plague in Japan.—This disease continues to prevail in both Osaka and Kobe. Up to date, since the beginning of the present outbreak, 121 cases with 76 deaths have been notified in Osaka; in Kobe 82 cases have occurred with 50 deaths. Including cases previously reported, 5 cases of plague confirmed bacteriologically have occurred in Shimonoseki. Doubtful cases of the same disease have been reported elsewhere in Japan, including Fukuoka Ken and Kagawa Ken. Vigorous measures to prevent the spread of the infection are being enforced by both central and local government authorities. In the case of arrival of either freight or passengers from the infected districts, the facts must be notified to the authorities.

OBITUARIES.

George Ryerson Fowler, of Brooklyn, February 6, following an operation for appendicitis at the Albany Hospital, Albany, N. Y. He was graduated from the Bellevue Hospital Medical College in 1871. He was surgeon to the Methodist Episcopal Hospital; surgeon-in-chief of the Brooklyn Hospital; consulting surgeon to St. Mary's Hospital; fellow of the American Surgical Association; member of the New York Surgical Society; Brooklyn Surgical Society; fellow of the Academy of Medicine; member of the State Board of Medical Examiners, and one of the Founders of *American Medicine*.

Richard A. Terhune, aged 77, of Passaic, N. J. February 3, from intestinal cancer, at the Passaic Hospital. He became ill about seven weeks ago and diagnosed his case as that of intestinal cancer with a fatal prognosis. He watched the progress of the disease until when he could no longer retain food took no nourishment except water, with an occasional dose of medicine.

Thomas F. Gibbs, aged 69, January 31, at his home in Montclair, N. J. He was graduated from the University of Georgetown, medical department, Washington, D. C. During the Civil war he was employed in

the War Department, returning to private practice at the conclusion of the war.

William Williams Robertson, aged 60, January 31, suddenly, from apoplexy, at his home in Baltimore, Md. He was graduated from the University of Maryland School of Medicine in 1864 and for several years served as resident physician of the hospital connected with the university.

Edward S. Dalrymple, aged 43, February 3, suddenly from heart disease, at his home in Branchville, N. J. He was graduated from the New York University, New York City, in 1885.

William Henry Keller, aged 48, of Harrisburg, Pa., February 1, from uremic poisoning, at the Harrisburg Hospital.

John A. Watson, of Frostburg, Md., February 2, following an operation for concussion of the brain.

THE PUBLIC SERVICE

Changes in the Medical Corps of the U. S. Navy for the week ended February 3, 1906:

G. ROTHANGER, surgeon, detached from the Naval Hospital, Norfolk, Va., and ordered to the Naval Hospital, New York, N. Y.—**A. FAHRENHOLT**, surgeon, detached from the Raleigh and ordered to the Oregon.—**G. F. FREEMAN**, passed assistant surgeon, detached from the naval station, Cavite, P. I., and ordered to the Raleigh.—**L. H. WHEELER**, assistant surgeon, ordered to the naval station, Cavite, P. I.—**P. M. RIXEY**, surgeon-general, commissioned surgeon-general and chief of the bureau of medicine and surgery, Navy Department, with the rank of rear admiral, from February 5, 1906.—**JAMES D. GATEWOOD**, surgeon, United States Navy, designated by the acting secretary of the navy, is detailed as a member of the joint board of medical officers of the army and navy, appointed by orders of January 11, 1906, War Department, to consider improvements in the first aid dressings and uniformity of equipment for the medical departments of the two services, vice Charles F. Stokes, surgeon, United States Navy, relieved.

Changes in the Public Health and Marine-Hospital Service for the week ended January 31, 1906:

P. C. KALLOCH, surgeon, reassigned to duty at Portland, Me., Quarantine Station.—**L. E. COFER**, passed assistant surgeon, letter granting leave of absence for twenty days from January 19 amended to read twenty days from January 20, 1906.—**S. B. GRUBBS**, passed assistant surgeon, granted twenty-one days' leave of absence from February 2, 1906.—**J. F. ANDERSON**, passed assistant surgeon, assigned to duty in the Hygienic Laboratory, effective January 23, 1906.—**W. C. HOBBS**, passed assistant surgeon, relieved from duty at Honolulu, Hawaii, and directed to proceed to San Francisco Quarantine Station and assume command of the service, relieving Passed Assistant Surgeon N. S. Cumming.—**G. M. CORPUT**, passed assistant surgeon, directed to proceed to Kenner and other places in Louisiana for special temporary duty, upon completion of which to rejoin station in New Orleans, La.; granted five days' leave of absence from January 16, 1906, under provisions of paragraph 191 of the regulations.—**A. J. McLAUGHLIN**, passed assistant surgeon, relieved from temporary duty at Berlin, Germany, and directed to rejoin station at Naples, Italy.—**GEO. L. COLLINS**, assistant surgeon, granted leave of absence for two days from January 22, 1906, under provisions of paragraph 191 of the regulations.—**W. L. STEARNS**, pharmacist, granted five days' extension of leave of absence from January 27, 1906.—**MATHIAS WALERIUS**, pharmacist, granted thirty days' leave of absence from February 15, 1906.

SOCIETY REPORTS

THE SOUTHERN SURGICAL AND GYNECOLOGICAL ASSOCIATION.

Eighteenth Annual Meeting, Held in Louisville, Ky., December 12, 13, and 14, 1905.

[Specially reported for *American Medicine*.]

[Continued from page 184.]

Experience with Downes' Electrothermic Angiotribe in Pelvic and Abdominal Surgery.—**J. WESLEY BOVÉE** (Washington, D. C.) had employed these angiotribes in 203 abdominal and 27 vaginal operations. These 230 operations had been hysterectomies and panhysterectomies, and the removal of the appendages by the vaginal route, removal of the same structures by the abdominal route, removal of the vermiform appendix, the spleen, the kidney, of parovarian cyst, of portions of the intestines, etc. The instruments were described in detail; also the technic of application. In these 230 cases he had had two of hemorrhage subsequent to operation. He could not believe the method of hemostasis employed was responsible in either instance. In the first, abdominal panhysterectomy was done for severe suppurative inflammation of the appendages of a very feeble and emaciated woman. Three weeks later, after being allowed to walk about for two days, she was seized with hemorrhage from the bowels, stomach, and vagina. A mass was found in the pelvis; her temperature became elevated, as was the pulse-rate. The hemorrhage continued at intervals for two weeks without improvement, and then the abdomen was reopened without any form of anesthesia, even local being refused by the patient. A large amount of blood coagulums was removed from the peritoneal cavity, vaginobdominal through-and-through rubber tube drainage installed, and thorough irrigation of the peritoneal cavity, with salt solution, was done after separation of multiform adhesions. Later feces and urine escaped by both ends of the drainage tract. Persistent irrigation and feeding cured her malady and she was a robust woman today. In another, two weeks after vaginal hysterectomy for fibromas, the patient had a sharp vaginal hemorrhage after walking a little more than on previous days. An examination with a Sims speculum revealed a malodorous discharge from the left lateral fornix of the roof of the vagina. The temperature was elevated about one degree. Daily irrigation for a week ended the trouble. In both cases he was confident latent mild infection was responsible for the hemorrhage. In no other instance had hemorrhage occurred, and he had the simplest and most perfect faith in the hemostatic properties of the instrument. The advantages of the electrothermic angiotribe of Downes in pelvic and abdominal surgery seemed to be a more reliable hemostasis than by ligation; freedom from hemorrhage during operation; the ease of its application in locations in which the use of ligatures would be very difficult and uncertain; the greater security against dissemination in radical operations for malignant disease; the ability to sterilize unclean areas before suturing, as in intestinal and appendiceal surgery; lessening of the tendency to the formation of postoperative adhesions; the increased speed in operations, such as removal of the uterus, the appendages, or the vermiform appendix, and the greatly lessened amount of pain following operation. The disadvantages were the danger of accidental injury of the bladder, rectum, and ureter; the necessity of great precision in its employment, and the special care necessary to keep the paraphernalia in good working condition.

Discussion.—**ANDREW J. DOWNES** (Philadelphia), in speaking of his instruments, stated that for four years he had not used a ligature except in the case of a woman upon whom he operated for extrauterine pregnancy, and

who was moribund at the time. He had performed intestinal anastomoses and gastroenterostomies with his instruments; other surgeons had removed gallbladders, kidneys, etc. Personally, he had done 400 or 500 hysterectomies with them, while other surgeons had performed from 60 to 70 hysterectomies with them. He did not think hemorrhage in the two cases reported by Bovée could be attributed to the use of his method. CHARLES P. NOBLE (Philadelphia) had used the Downes instruments a number of times in cases of removal of the uterus for cancer, and said they were a great advance in this operation. They possessed a number of advantages over the application of the ligature. The chief advantage of the clamps over the ligature was that after the uterine arteries were tied on each side, when one came down to the vaginal plexus, which was the most troublesome part of the operation when using the ligature, the veins were apt to leak and flood the field, requiring a number of ligatures to secure hemostasis around the cut vagina. If these instruments were used, the field would be perfectly dry. There was no trouble from hemorrhage. From the standpoint of recurrence of cancer, the instruments had not been used long enough to give figures as to results; but one could believe from the work of Byrne that much better results could be obtained with the aid of these instruments than with ligatures, etc. HOWARD A. KELLY (Baltimore) said he saw Keith, of Edinburgh, in 1887, remove an ovarian tumor with Skene's instruments; but those instruments were not satisfactory, and when Downes brought out his instruments he procured a set of them and had found them satisfactory, with the exception that he had not been able as yet to install a satisfactory plant in the Johns Hopkins Hospital for their use. While the Downes instruments were practical and useful in surgical work, he thought if surgeons exercised more care as to the character of ligatures they used daily, it would limit the use of the Downes method of instrumentation. He referred to the importance of using fine silk ligatures which controlled bleeding from large blood-vessels and were practically innocuous.

[To be continued.]

WESTERN SURGICAL AND GYNECOLOGICAL ASSOCIATION.

Fifteenth Annual Meeting, Held in Kansas City, Mo.,
December 28 and 29, 1905.

[Specially reported for *American Medicine*.]

[Continued from page 123.]

Carcinoma of the Descending Colon.—W. W. GRANT (Denver) said that the rectum was the most frequent seat of intestinal cancer. The descending colon was next in order. Cancer of the stomach was more common than that of the intestines and its progress was more rapid. Cancer of the colon was more common in men; it was not common under the age of 30. It was primary and circumscribed. Metastasis and constriction were late occurrences. Chronic indigestion, both occasional diarrhea and mucus discharges, were suspicious symptoms. Ulceration was of late occurrence. Floating kidney and membranous colitis might exist a long time without producing marked symptoms or seriously disturbing the health. It was less malignant than the same disease of the stomach or rectum. It was not painful until late. Stenosis was not attended with striking symptoms until obstruction was complete. Mild malignancy and late infection demanded radical operation. More care was necessary in examination at an early period in order to detect disease. He reported a case of long duration. Typhlotomy was followed by radical operation later. Methods of procedure were considered; intestinal anastomosis and results.

Discussion.—I. B. PERKINS (Denver, Colo.) saw a woman, aged 62, about three weeks ago, in whom there was a tumor in the groin in the region of the cecum. It was supposed by the physician who had charge of the case to be an appendiceal abscess. It was very hard. There was vomiting of fecal matter and had been for 24 hours. He made a long incision in the right rectus, and on examination found a hard tumor but no pus. The appendix was caught in the mass, the ileocecal valve, and portion of the cecum. He resected the intestine and closed the end of the colon by the use of the Connell suture, then implanted the ileum into the upper portion of the wound. The patient did well, except there was slight leakage at the outer and upper portion of the anastomosis, and patient had a very small fecal fistula, which he thought would close soon. He thought another time he would close the ends of both guts and make a lateral anastomosis. A. W. ABBOTT (Minneapolis) called attention to one feature connected with cancer. He had seen two cases of intussusception in his own practice and one in the practice of the late Dunn. He thought intussusception occurred in cancer oftener of the large intestine than of the small. He had never seen a case in the small intestine, but he had no doubt it might occur. He thought it was wrong to make an immediate anastomosis in these cases, because they were the ones in which a colostomy should first be made, because the condition about the cancerous area was so extreme that the parts would not unite if one attempted to sew them. J. E. SUMMERS (Omaha), in speaking of the location of carcinoma of the large intestine, said he had found it everywhere in the large intestine except at the hepatic flexure. In dealing with carcinoma of the transverse colon it was necessary to manipulate the gastrocolic omentum. Unless this was done with the greatest gentleness one was apt to have a complication following the operation which might be serious, namely, hemorrhage into the stomach. A week ago he removed the transverse colon for carcinoma, and as a result of manipulation there was a serious hemorrhage for several days from the stomach. His attention was first directed to this complication some years ago following an operation for incarcerated umbilical hernia, in which it was necessary to remove considerable portions of the omentum and the manipulations had been very rough. The operation was proceeded with without any special difficulty, but it was followed in two hours by profuse hemorrhage from the stomach, from which the patient died. GRANT, in closing the discussion, said he wanted to urge one point, namely, the symptoms of this disease were not pronounced at an early period; but when there were suspicious indications it was very important to use more care in examining these patients than the surgeon was accustomed to do. Under favorable conditions, when the bowels were thoroughly evacuated, the surgeon might discover the presence of a growth in the colon, and this was the time when operation brought about such satisfactory results, and also was the period when operation could be done at one sitting.

Tuberculous Peritonitis.—T. E. POTTER (St. Joseph, Mo.) spoke of the etiology of tuberculous peritonitis, of the symptoms and diagnosis, giving the more modern views on the subject. An early diagnosis was highly recommended and the physician urged to be on the alert when there were any symptoms pointing toward tuberculous peritonitis. The success in treatment at any age was much greater when the disease was recognized before it had made too extensive progress. In the treatment, the writer gave preference to surgical methods, showing that at least 66½% or more recovered in the hands of surgeons, while not more than 33½% recovered after medical treatment, by the latest and most approved methods of hygiene and the administration of medicine. A discussion of the theories as to the benefit of surgical interference was taken up in the paper.

[To be continued.]

ORIGINAL ARTICLES

ARTERIOSCLEROSIS AS A GENERAL DISEASE.

BY

ALFRED STENGEL, M.D.,
of Philadelphia,

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It is noteworthy that there remains so much that is obscure and uncertain about arteriosclerosis when one considers the amount of investigation that has been devoted to it and the seemingly satisfactory conclusions that have been reached in certain directions. The recognition of arterial disease as a factor in certain organic conditions, such as cerebral hemorrhage, myocardial disease, focal necroses, gangrene, aneurysm, and some other localized processes, seemed to have established a quite comprehensive understanding of the pathologic importance of the condition until Gull and Sutton and Lanceriaux showed the much broader relations of the condition and opened up a field for investigation, both clinical and pathologic, far more extensive and difficult. The conception of arteriosclerosis as a merely passive process of hardening of the vessels which may or may not occasion serious embarrassment of the circulation and secondary results due to cardiac failure, thrombosis, embolism, or rupture of the vessels—this older conception is now completely out of date. A proper picture of the condition portrays a more general disturbance of the whole organism, a tendency to widespread degeneration of tissues, and in the early stages nutritional or metabolic disorders in part the concomitants of the causal conditions and in part the result of the initial stages of the arterial disease. To be a little more specific: it must be recognized that with advancing arteriosclerosis, there is disturbance of organic functions not confined in a strict sense to the circulation, but involving digestion, renal action, various nervous mechanisms, perhaps also the hepatic processes and general metabolism. These are not definitely the results of mechanical disorders of circulation, and the moiety dependent upon the underlying causes of the disease cannot be surely distinguished from that which results from the arterial disease itself. I am speaking now of early stages and may illustrate by a striking case that came under my observation recently.

A gentleman, aged about 60, who had been accustomed for many years to a generous (that is, immoderate) life, who had consumed much alcohol, and who was manifestly gouty, first developed an obstinate form of eczema, then a dry pleurisy, later a dry pericarditis, and finally a condition in which loss of weight, loss of vitality, increasing pallor, disturbances of circulation, slight cardiac pain, dyspnea, and flatulent dyspepsia were conspicuous. At this time definite hardness of the peripheral vessels was discovered and increasing circulatory disorder followed.

One might in such a case conceive of the pathologic process as simply a form of generalized gout affecting first the skin, next the pleura, then the pericardium, and finally the cardiovascular apparatus; but as the trouble advanced, the significance of the arterial element became more and more marked, and the separation of the role of the original cause from that of the secondary

process became somewhat difficult, though it was evident that each bore a notable part. It is interesting that in this case a thoroughgoing regulation of the patient's life and a course of treatment at Nauheim apparently arrested both processes for a time. Up to the period at which this case had arrived there were no terminal changes in important organs, not even as far as could be discovered in the heart.

In the middle stages, however, of arteriosclerosis widespread organic lesions do occur. The effects of coronary sclerosis in the heart muscle are well known; the frequency of renal sclerosis has been emphasized by Gull and Sutton and many others, the cerebral and even spinal results are familiar, though only recently fully recognized; the lungs, the pancreas, gastrointestinal tract, and even the liver, so scantily supplied with arterial circulation, suffer degeneration and atrophic change. It is not my purpose to discuss the relations of the arterial disease to any of these organic changes, nor to estimate the frequency of an arteriosclerotic origin of the organic changes in question. Those who are impressed with the importance of arteriosclerosis as a generalized disorder perhaps overestimate its part in the causation of such diseases, but the profession as a whole undoubtedly fixes its attention too closely upon the conspicuous manifestations presented by the organ that happens to be principally involved. It cannot have escaped the attention of any of us that chronic interstitial nephritis as an independent affection is less frequently discussed than formerly, though the opinion that this particular form of renal disease is nearly always a result of arteriosclerosis is possibly extreme. Doubtless there are occasional cases of primary chronic interstitial nephritis with secondary arteriosclerosis, just as there are frequently cases of chronic diffuse nephritis with such a result. Somewhat similarly chronic myocardial disease independent of valvular disease and arteriosclerosis is less frequently recognized than formerly.

In the second period of arteriosclerosis as in the first, there is difficulty in recognizing the part of the arterial disease in the general condition, since the secondary organic disorders contribute a more or less indistinguishable portion of the clinical picture.

Finally in the last phase, whatever the type of the case, increasing circulatory disturbances usually dominate the whole process. There are cases of purely renal or cerebral death, but as a rule, even when the type has been cerebral or renal, cardiac failure terminates the scene. It must not be forgotten, however, that in this final stage increasing susceptibility to infection with decreased circulation may occasion terminal infections, especially pulmonary and peripheral. We may then recognize three stages of arteriosclerosis considered as a general disease:

1. A preliminary one, difficult of recognition in its beginnings and confusing to the clinician in his efforts to distinguish what part the etiologic factors have contributed to the symptom-complex and what part has resulted from the arterial disease itself.

2. A middle period, during which the arterial disease is easy to recognize, but in which secondary organic changes have a role of variable importance.

8. A final stage of failure of circulation, organic failure, and terminal infections.

The diagnosis of arteriosclerosis is usually established during the second period, and then rarely offers serious difficulty. Only when undue attention is given to some local disturbance, such as albuminuria, palpitation, or vertigo, or when the vascular disease is so uniformly distributed that it manifests itself only in a general failure of vitality, is the recognition of the disease likely to occasion confusion. In the final stages, too, though the form of local disease and the immediate occasion of the patient's failing health or taking off may be too much emphasized in the physician's mind, the contributory influence of the hardened bloodvessels rarely escapes attention.

So much has been accomplished for the recognition of arteriosclerosis as a general disease and as the foundation for morbid processes of varied type. Only recently, however, has the campaign of investigation been extended to the earlier stages, the period when obscure and less certainly organic vascular conditions present themselves. I recognize the uncertainty of conclusions drawn from such pathologic and clinical investigations as have been made, but it cannot be denied that considerable testimony justifies the tendency to regard beginning arteriosclerosis as a general cause for certain obscure forms of disease or disorders of health and vitality.

A clearer view of the conditions in this stage will be obtained after a brief survey of the pathologic features of the disease of the arteries and a reference to some of the etiologic factors. Arterial hardening is one of the factors in the pathology of senility and a greater or less degree may be expected in every human being beyond the age of 60. How much earlier such changes may occur depends upon various conditions of life. Undoubtedly in many the process begins quite early and progresses so regularly and slowly and with so little disturbance of circulation or other functions that it long remains unrecognized or even unrecognizable. Quite different from this normally progressive arterial disease is that which is met with in younger subjects. More conspicuous than any other difference is the tendency to restriction of the process to certain localities, or at all events to the greater involvement of certain vessels. In the senile form there is a more uniform process involving the vessels of the center and periphery more or less equally, and with this I believe there is a coincident involution of somewhat the same character involving the body as a whole. It would lead too far to discuss the reasons that seem to me to justify this view that the tissues generally are involved somewhat independently of the arterial narrowing and failing circulation, but I must at least refer to the fact that general sclerotic processes in the organs and their capsules and shriveling of the tissues are sometimes distinctly out of proportion to the arterial involvement. Whatever may prove to be the truth as to this view, there is no doubt that the symptoms of normal senile arteriosclerosis are strikingly scanty as compared with those encountered in cases of the presenile disease. It may be said in answer that only the cases which proceed in a quiet progressive fashion are classified as normal senile types, but, on the other hand,

we cannot but appreciate that the cases recognized early are those which are in a majority of instances likely to be attended with marked disturbance of health and with definite organic disease. I have come to the conclusion that the presenile cases are in the matter of their nature as well as their time of occurrence more distinctly pathologic; that by reason of their comparatively greater involvement of the arteries than the tissues as a whole they are more prone to cause notable functional disturbances, and for the same cause are more likely to run a rapid course.

There is still so much uncertainty as to the exact role of laborious work, alcohol, other intoxications, overfeeding, nerve strains, gout, primary renal disease, heredity, and infections in the causation of early arteriosclerosis that it is impossible to express certain convictions regarding the existence of a form of arterial disease due to such causes differing from the normal involutional type. But it is of interest to note in this connection how generally certain syphilitic diseases of the arteries are distinguished by pathologists from ordinary arteriosclerosis, a distinction that until quite recently has been regarded as of doubtful justification.

The obscurity of the early changes in the bloodvessels and the uncertainty regarding the part of the vascular system first involved, the clinical difficulty of determining accurately the circulatory conditions of the early stages, and the want of reliable information as to the physical and chemic properties of the blood in the beginning stages have thus far made the study of the origin of arteriosclerosis an unproductive one. Physiologists and clinicians have occupied themselves with determinations of blood-pressure and various investigators insist that there is a preliminary presclerotic stage of continued high blood-pressure. This has been attributed by some to spasm of the arterioles or contraction of the capillaries due to toxic or nervous influences, by others to some change in the viscosity of the blood causing obstruction of the circulation. The latter view rests upon hypothesis, pure and simple; the former is based upon observations, which, with von Basch, I believe, have often been conducted in cases of already established arteriosclerosis. Those who maintain either of these views contend for a presclerotic or a preorganic stage of the disease. My own clinical studies in cases that have under observation developed arteriosclerosis have convinced me that in the earliest stages there is rather a condition of decreased tension with a tendency to temporary or paroxysmal elevations. In such cases I have not been able to persuade myself that there ever is continued hypertension and I am, therefore, disposed to believe with some pathologists that the earliest condition in arteriosclerosis is one of loss of elasticity in the vessels from changes either in the media or intima, or both, that the changes are initiated by toxic alterations (degeneration) of the vessel walls and not by spasm due to such toxic agents. Beside the reason given (the arterial pressure in developing cases) would base this view on certain clinical symptoms, such as paroxysmal sweating, variable quantity of urine, and temporary and slight edema. Whether, however, there be spasm or relaxation of the peripheral vessels in the

early stages, there are certainly altered conditions of circulation in these vessels, and in view of the fact that the changes are more or less widespread in every organ of the body one readily appreciates that generalized disturbance of function will occur. If one trace back the history of cases of rapidly developed general arteriosclerosis, one will find a gradual development of certain symptoms that indicate such a falling off or perversion in organic function as the postulated conditions would probably occasion. Loss of vitality, decreased resistance to external conditions and a tendency to slight infective ailments, nervous depression, various organic derangements, moderate circulatory disturbances—these are among the early signs of the beginnings of the disease. They may with some probability be referred to the derangement of the intimate circulation of the organs of the body and perhaps to metabolic disorders partly caused by the original cause of the disease and partly by the effects of the vascular disease on organic action.

Among the varieties of early arteriosclerosis, I have observed several more or less distinct types, nutritional, neurasthenic, and nervous.

Nutritional Type.—The cases of this group present obscure disturbance of general health with a tendency to digestive disorders and anemia or pseudoanemia. There may be little loss of weight at first, but in rapidly developing cases emaciation may proceed rather steadily. In some there is the appearance of a causeless progressive deterioration of health; in these cases, a tendency to acute infective diseases in themselves perhaps trifling in character may be conspicuous. I have in mind instances of individuals, who, during the developing period of a presenile arteriosclerosis suffered repeated attacks of laryngitis, bronchitis and other minor ailments of this sort. The impairment of health was out of proportion to the character and severity of the infective disease and probably more dependent on the underlying cause than on the acute incident.

I have elsewhere spoken of the importance of pseudoanemia in the diagnosis of arteriosclerosis. As a rule it is a condition of the more advanced stages, but sometimes makes its appearance rather early. I have shown that it is more largely the result of contraction of the vascular channels with resulting pallor than of deterioration of the blood.

Neurasthenic Type.—In some of the cases of beginning arteriosclerosis with or without definite nutritional disorders, the patient presents various evidences of neurasthenia. Perhaps the most striking instances are seen when arteriosclerosis occurs in the fat, but sometimes it becomes progressively more marked as emaciation proceeds. It is of course difficult to distinguish between the neurasthenic symptoms that may attend a developing arteriosclerosis and such secondary arteriosclerosis as may engraft itself upon a preexisting neurasthenia.

There are no special symptoms that distinguish this type of neurasthenia from others, excepting that circulatory symptoms are perhaps more common.

Nervous Type.—Beside the neurasthenic variety there are types of arteriosclerosis in which certain nervous symptoms are conspicuous. When the hardening of the vessels is considerably advanced, various central

nervous symptoms may be met, such as temporary paresis, spasmodic or convulsive disorders or disturbances of consciousness. In earlier stages, however, minor symptoms, such as a tendency to vertigo, tinnitus and disturbing sounds in the ears or syncopal attacks may occur. Peripheral symptoms of the type of claudication are met with in a variety of forms. In a few reported instances there has been extraordinary muscular weakness, even when collateral circulation had developed quite extensively. Migraine and neuralgic troubles also figure among the forms of nervous symptoms in the early stage.

In the more advanced stages arteriosclerosis is easily recognized by the discovery of palpable thickening of the bloodvessels, by the increased vascular tension, by the auscultatory phenomena at the heart, and by the general appearance of the patient. The disease presents itself in a variety of forms or types, according to the special involvement of one or another of the important viscera, or by certain special vascular conditions. I have been in the habit of classifying such cases under the following headings: (1) The thoracic type, of which we may distinguish the (a) cardiac or (b) aortic; (2) the abdominal type, of which there are (a) renal, (b) intestinal, (c) pancreatic, and (d) hepatic varieties; (3) the cerebrospinal type, and (4) the arteriocapillary type.

It is unnecessary to discuss each of these at length, but a few words about the more important features may be added to complete the presentation of my subject.

In the cardiac variety there may be moderate disturbances of the heart's action with a tendency to arrhythmia, more pronounced symptoms of myocarditis, or even the symptom-complex which we designate as angina pectoris. The immediate occasion of these disturbances is doubtless in the majority of cases some special involvement of the coronary vessels. It cannot, however, be denied that without special involvement of these vessels there are sometimes cardiac lesions and symptoms resulting from the general vascular disease and the undue strain placed upon the heart.

By the aortic type I mean not merely those cases which show a tendency to fusiform dilation of the arch or aneurysm, but also cases in which without dilation the arch of the aorta is involved in a marked process of sclerotic and calcareous change and in which there are symptoms of cardiac embarrassment and physical signs indicative of roughness in the lining of the aorta at this point. These cases it is important to recognize as being distinguishable from cases of aortic stenosis with which there is a certain resemblance in their physical signs.

The renal variety manifests more or less markedly the wellknown symptoms of chronic interstitial nephritis. In a great majority of cases of advanced arteriosclerosis slight albuminuria appears from time to time and hyaline casts are occasionally seen. Only in a minor proportion of the cases do the renal conditions advance to a stage of well-defined interstitial nephritis. This sometimes stands out conspicuously while the arteriosclerosis is less evident. On the other hand, in certain cases it may be at once apparent that the renal disease is but a part of the arteriosclerosis, which is the more pronounced condition.

Intestinal types of arteriosclerosis are less commonly recognized. Atrophy of the mucous membrane, and a tendency to chronic colitis, ulcerations in the upper part of the small intestine, and forms of sudden painful obstructions (paresis of the walls) of the bowel are among the more important intestinal conditions.

Pancreatic cirrhosis as a part of general arteriosclerosis is unusual and rarely presents clinical symptoms sufficiently distinctive to make it recognizable during life. In some cases the pancreatic lesion may occasion diabetes.

Hepatic cirrhosis, as a consequence of arteriosclerosis, is less likely to occur than are sclerotic lesions of other organs, for the reason that the circulation of the liver is so freely anastomotic and that the artery supplying the liver is, comparatively speaking, a minor factor in the circulation of the organ. When this disease does exist in association with arteriosclerosis, it is more likely that the same cause had been operative to produce both conditions than that either was a sequence of the other.

Cerebrospinal types of arteriosclerosis are numerous and varied. In the more advanced stages, when the vessels have become greatly thickened, temporary palsies or aphasia, slight convulsive seizures, suggesting petit mal, and attacks of sudden unconsciousness occur. Probably a number of definite nervous diseases of cerebral causation have as their underlying basis arteriosclerosis of the cerebral vessels. It is impossible to discuss these at the present time.

By the arteriocapillary type, I mean cases in which either in the presenile or the senile period of life generalized arteriosclerosis occurs without definite local organic involvement, in which in other words the condition of the vessels alone is conspicuous and moderate circulatory disturbances call attention to the vascular disease.

ASTHMA: A REPORT ON THE ETIOLOGY AND TREATMENT OF SOME INTERESTING CASES.

BY

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Work upon this paper was begun with considerable enthusiasm, because of the rather unique character of one of the cases and the apparently excellent results which followed an unusual method of treatment. Several months had passed since the patient gave his cheering report and it was thought best to inquire into his condition again. The gentleman in question, a prominent Denver merchant, was interrogated in regard to his asthma and constipation and responded that he was very well, then paused, and said that during the last five months he had been under the care of a woman—a christian science healer. I was about to report this case as one of asthma and obstipation cured by medical and surgical means. This experience goes to prove that before reporting patients as cured or benefited one should obtain complete histories taken months, and even years subsequently.

On second thought it has seemed to me that the article will be just as useful under the present conditions as if the case had been a complete success.

It would only prove tiresome were I to recount the symptoms and discuss the theories of the etiology of asthma and enumerate the countless drugs and methods used in its treatment.

Instead, I shall give you the deductions drawn from the careful study and examination of several cases which presented an interesting variety of points in history and physical examination.

Most of us have grown body weary, heart sore, and mind distraught in our efforts to relieve and cure many of our stubborn cases of asthma. We have tried nearly everything in the pharmacopeia, and still the patient wheezes and fights for breath like a drowning man, and in our efforts to relieve suffering we are in danger of making morphin fiends of those we vainly would cure. Electricity, röntgen ray, change of climate, have all been tried and in many cases without results. We are relieved when the patient changes physicians; one is somewhat mortified, however, when told a little later that after taking up christian science, or osteopathy, or patent medicine, improvement began.

A man with asthma, though he may possess the highest ideals and ethical notions, does not care a rap from what low source his relief comes, hoodoo, voodoo, quack, or christian science; nor would you or I, were we victims of the disease; all he wants is relief.

The risk which most of us run in handling cases of asthma is that we simply consider them asthmatic; that is, sufferers with either bronchial asthma or hay asthma. We treat them in the same old routine way with potassium iodid, arsenic, etc., tonics, electricity, change of climate between attacks, and the innumerable anti-spasmodics during attacks. We treat the name asthma instead of the patient.

Our results would be much better and our diagnostic ability greatly increased were we to make a close study of each patient, making a vigorous effort to locate the reflex (the locus minoris resistentiæ) which directly or indirectly has considerable bearing on the development of the attack. From the work of others and from my own past experience I know that abnormal conditions in the nose and throat are responsible for some cases; again, clinical experience proves that reflexes from the stomach and intestines frequently provoke attacks in susceptible people. By the same token the genitourinary system should be investigated; in truth, every possible source of irritation.

We all appreciate the fact that the same and more aggravated conditions are present in hundreds of other cases without the production of asthma, while in the susceptible patient asthma results. Why is this? Individual peculiarity, idiosyncrasy, a weak nervous system, a neurotic basis, together with a vulnerable area of mucous membrane, and an irritant or exciting cause, internal or external.

These facts offer the keynote to successful treatment, if there is any. Search out the reflexes, remove the irritant if possible, and treat the diseased mucous membrane; also treat the nervous system by tonics, electricity, change of climate, rest cure, charms, mental science, anything which accomplishes the desired result. One gains no lasting credit in relieving a spasm of asthma

by the use of hypodermics of morphin and atropin, the employment of the various antispasmodics, adrenalin and cocain inhalants, chloroform, etc. The druggist can and does treat the attacks almost as successfully as we can.

The man who diagnoses all of his cases as bronchial asthma and regularly prescribes potassium iodid, nitroglycerin, or some manufacturing pharmacist's shotgun prescription, will help some sufferers, but others will be made infinitely worse, because their cases are perhaps dependent on stomach and intestinal disturbances, which are aggravated by these drugs. A case in point: A former college chum of mine was a sufferer from asthma in its worst form. To his mind and that of a medical student friend the attacks were dependent on some stomach or intestinal disturbance associated with marked fermentation. The junior medical student taught him how to use the stomach-tube and the patient obtained great relief. (The condition should have been investigated further, of course, along this line with test-meals, etc.) Later this patient went to Southern California and consulted one of the most prominent chest specialists in that section. He was immediately placed on potassium iodid, and as quickly began to go from bad to worse; his digestion was completely upset and his asthmatic attacks began with renewed vigor.

The following case proved very interesting and instructive to me. It furnished the animus for the writing of this paper. I believed great results had been obtained because of a correct diagnosis and proper treatment, only to be undeceived some months later, when a completed history was taken. The neurotic element proved to be the most important factor in the case.

CASE I.—The patient is a grocer, aged 38, and married. He is sallow and spare and appears to be poorly nourished. He has been suffering severely with typical attacks of asthma for 15 years. He has been more or less constipated all his life and obstinately so for 15 years. The attacks of asthma seemed to bear an intimate relation to the constipation. As soon as the stomach and bowels are relieved the asthma is better, but if he takes strong, irritating cathartics the asthma is made worse. If his bowels do not move, then he is sure to have an attack of asthma. His wife has broken up attacks by moving the bowels with sodium phosphate. There are days when the bowels move normally, then without apparent cause become constipated, the abdomen becoming distended with gas. Interesting peculiarities about this case are the premonitory signs of the attack; a tickling in the left ear or a soreness in the neck are sure indications of an oncoming seizure. The attacks are more frequent in winter than in summer. There is a remarkable periodicity about the appearance of the attacks. They occur every Saturday or Thursday. The history pointed to the gastrointestinal tract as the most likely seat of the reflex. Examination revealed a moderately prolapsed stomach. The right kidney, however, could not be felt. Rectal examination with the Kelly proctoscope revealed an enormously hypertrophied rectal valve, extending nearly two-thirds of the distance across the lumen of the gut, from left to right. It was with considerable enthusiasm that this condition was contemplated, as it seemed that the cause of the obstipation and secondarily of the asthma had been found and that both would be relieved by operating on the valves. Analysis of the stomach contents three hours after a Riegel test-dinner showed a hyperchlorhydria. Free HCl, 39; total acidity, 100. On November 28 the rectal valve was operated on by Dr. Craig. On December 6

the patient stated that with the aid of a small injection he had the most satisfactory bowel movement of the past 20 years and that he was practically free from asthma. On December 15 and 16 he had normal stools without enema or physic. On January 7 the patient had a slight attack of bronchitis, not like the former attacks and without stomach and bowel symptoms.

At this time, when it appeared as if a cure had been accomplished, I lost track of the patient. About August 1 (six months later), the following completed history was obtained: So long as his physician continued to treat him with static electricity and laxatives, and he refrained from work, he continued passably comfortable, but was gradually returning to his old state. Soon after resuming work in his grocery he got as bad as ever, losing two or three days every week because of asthma and constipation. He now took up christian science with enthusiasm. A healer was called in and he attended church and studied the subject. In three days the bowels showed some activity, and for five months his bowels have been moving regularly without medicine or mechanical help.

Three weeks after beginning the science treatment he had the severest 50-hour attack of asthma of his experience. Since this time he has had no hard attacks, and they are growing lighter and gradually wearing away. He is freer from asthma than he has been for three years past. There has been a general all around improvement. He is more cheerful and buoyant and is losing his fear of the attacks.

CASE II.—A middle-aged man, while under the care of good general practitioners and a nose and throat specialist in Denver, had been suffering tortures from asthma without any relief. In despair, his wife began looking over patent medicine advertisements in the daily press. It was decided they should send for the "Ezuma Asthma Cure," Chicago. In relating his experience the patient writes his doctor as follows: "I put it on April 1, and I was better in ten days and was comparatively free until June 1, without any medicine. (The patient was then at one of the summer resorts of Northern Michigan.) On reaching this place I had an attack of asthma which lasted more or less for thirty days. I resorted to medicine and have been free from asthma up to the present date, August 13. The remedy consists of a coon skin chest protector, worn fur side in. I have had several \$5.00 reliefs from the use of mine, and I am free to say I believe that it is doing me good."

One of Dr. John Foster's patients told him that she had bought one of these coon-skin asthma cures and that it had cured her. She simply looked at it and it scared her so to think of that thing scratching away on her chest that she has not had a sign of the trouble since.

CASE III.—Several years ago (in 1900 I believe) a postgraduate medical student, while working with some cultures of the pest bacillus, in the bacteriologic laboratory of the University of Michigan, by accident sucked some of the germs into his mouth. As a result he developed plague pneumonia. The physicians interested in the treatment of the patient all took immunizing injections of Roux antipest serum obtained from the Pasteur Institute. Drs. Vaughan and Dock received injections of 10 cc. from one bottle and Dr. Novy and myself 10 cc. from another bottle. Drs. Vaughan and Novy experienced no unpleasant effects. Quite another story with Dr. Dock and myself. Six days later (after the injections) I was called to see Dr. Dock and found him a mass of giant hives and suffering the tortures of the damned with the frightful itching. Six hours later I myself was in the same dreadful condition. From the crown of my head to the soles of my feet I was covered with giant hives. My eyes were swollen nearly shut, my lips were three times their usual size, and the soft palate was

water-logged to such a degree that it felt like a large foreign body in the pharynx. The itching was intolerable and beyond description. About midnight I was suddenly attacked with a paroxysm of asthma, my first and last. It persisted for about a half hour and left as suddenly as it came. My equanimity was considerably disturbed, as I feared edema of the glottis. I soon realized that a crop of hives had developed in my bronchi (an acute tumefaction) similar to the condition in the uvula.

This report is interesting in connection with the theory of one of the older writers—that asthma was due to the development of hives within the bronchi. It also is a strong point in favor of the theory championed by Störck—that asthma is due to an acute tumefaction of the bronchial mucous membrane, rather than a spasm of muscles of the bronchi.

CASE IV.—In 1900 a large, powerful Irish farmer of about 30 consulted me because of a severe attack of asthma; at the time of his visit he was breathing laboriously and wheezing noisily; in fact he could hardly drag himself into the office. He had been in this distressing condition and unable to sleep for about six weeks. He also complained of vomiting and distress after eating. Physical examination revealed a dilated, atonic stomach, with retention of food. Analysis of the stomach contents showed great reduction in the hydrochloric acid. Stomach washing, dilute hydrochloric acid, a bitter tonic, a few doses of chloretone, and control of diet gave him quick relief. It continued for many months to my knowledge. This was a case of asthma dependent on a gastric reflex, and was easily relieved by correct treatment. A course of potassium iodid would simply have made him worse.

CASE V.—This case is of interest because of the presence of the very rare phenomenon of unconsciousness during the attack of asthma. The patient, a single woman of 30, of a markedly neurasthenic type, had been sent to Colorado because of asthma and tuberculosis. While in the middle west she was such a severe and continuous sufferer from asthma that she came to rely too much upon morphin. There was marked improvement during her residence in Colorado, and her physician deemed her well enough to venture a summer in the east. While en route from St. Louis to Denver, August, 1904, she had a slight attack of asthma. On reaching Denver it became very much worse. The patient thought that she had taken cold, and there were definite signs of a dry pleurisy in the lower right chest. It was also her sick time. Kutnow's cigarettes were smoked with practically no relief. A hypodermic of morphin, 0.016 gm. ($\frac{1}{3}$ gr.), atropin, 0.5 mg. ($\frac{1}{100}$ gr.) was administered at 6 p.m. There was only slight relief, and at 9.30 p.m., because of the intensity of the suffering, I administered morphin, 0.008 gm. ($\frac{1}{3}$ gr.) and atropin, 1 mg. ($\frac{1}{80}$ gr.). During my absence the patient fell to the floor unconscious; the pupils were a trifle dilated, and did not react to light. The heart action was extremely weak, hardly audible with the stethoscope. This was partly due to the overdistention of the lungs, as the pulse was stronger than the apex beat or first sound would indicate. The respirations were very shallow, and the signs and symptoms of the asthma were much better than during consciousness. The hotel physician, who was summoned in the emergency, thought it a case of dilated heart from the altitude, and considered the patient beyond help. She remained unconscious from 9.30 p.m. till 3 a.m. During the last two hours there developed opisthotonos and rigidity of all muscles, and a turning in of the feet. Later on I learned that the patient had become unconscious during a number of previous severe attacks.

CASE VI.—A girl of 5 had suffered for several years

with a bronchial asthma of the gravest type. It seemed to be dependent on a bronchial reflex, as a careful examination of the nose and throat by a competent specialist revealed nothing abnormal, and the stomach and intestines were apparently negative. She was extremely sensitive to cold and dampness and developed a bronchitis under the slightest provocation. A severe attack of asthma was the almost invariable sequel. The suffering of the child was pitiable in the extreme; at times the attacks would last from 48 to 72 hours, in spite of vigorous therapeutics.

An attempt was made to improve her general health by the use of tonics, cold sponges, turpentine rubs, and digestives. The bronchitis was also treated with potassium iodid. The pharmacopeia was ransacked to help the little sufferer, but the best results were obtained by the inhalation of plain water or lime water in a steam atomizer. Change of climate to the lowlands of Texas was tried one winter without results. (This was Hobson's choice of climate.) The child was always better during the hot, dry weather, and it is most likely that if she could have gone to Colorado, New Mexico, or Arizona great improvement would have followed, as these climates would have helped the bronchitis, which seemed to be the determining cause of the asthma. The child had been in the hands of a number of physicians, whose administrations had all been equally futile so far as curing the asthma was concerned. After the passing of two years I received the following letter from the child's mother in regard to the case:

"I kept up the cold sponge baths, rubbings with turpentine and sweet oil, for a long time after you left. There was no improvement, but instead Ruth got weaker and had her attacks about every three weeks and her suffering was something painful to see. A year ago last December we were persuaded to try osteopathy. She was so poorly when she started to take the treatments that she could not walk the length of the room without being all done out. She took three treatments a week all winter. They had to be very light and short on account of her weak condition. The improvement was slow at first, but by spring there was a marked change for the better. She then took but two rubbings a week and by warm weather she was feeling splendid; was able to run and play. She even went barefoot some of the warm days. Her improvement was continuous until the cold weather set in and I tried keeping her out of doors for a small portion of the day. I found I could not do this. She was all right again as soon as I kept her in from the chill air. She did not need the temperature so high and did not suffer from a little variation. Her circulation was so much improved that I was able to discard some of her extra warm clothing which I had been forced to have her wear. She stopped taking treatments last fall, felt splendid all winter and up to last June. She has not been so well this summer, so we have started to give her the rubbings again. I feel it is the only thing that will help her. The steam atomizer is a good thing; I use simply hot water or hot lime water. This helps to loosen the cough and makes her throat feel better."

A medical acquaintance of mine reports excellent results in asthma in children by the use of salophen.

Dr. J. A. Wilder speaks enthusiastically of large doses of sodium salicylate in certain cases because of the following experience:

A young man of the thick-set, plethoric type suffered severely with asthma; nitroglycerin gave no relief whatever. Because his urine was loaded with urates, it was thought that the attack might be due to the circulation of irritants in the blood, a deficiency of elimination (this practically corresponds to Haig's uric acid theory), so he was placed on very large doses of sodium salicylate. He began to improve as if by magic; the dosage was then

reduced. The psychic element was small, because the patient was told what he was getting, and also was told that the physician was sceptical as to results. The patient has been free from asthma now for many months.

Another medical friend has been able to relieve attacks of asthma completely by hypnosis.

The fact that many patients improve for a short time after consulting a new physician, or taking up christian science or osteopathy, is fairly good evidence in favor of the neurotic basis of the disease. Psychic therapy has certainly a field for activity in this disease.

A senior medical student at the University of Colorado studied osteopathy at Kirksville, and practised this art for a number of years. Among his patients were a number of asthmatics. His results were eminently unsatisfactory. The treatment was the same for all. It was based upon the theory that asthma is caused by a subluxation of the first five dorsal vertebrae with consequent pressure upon the corresponding intercostal nerves. (This word subluxation represents the great advance made in osteopathy. A few years back it was dislocation.) The treatment consisted of very vigorous manipulations to move the vertebrae and their attachments; also to expand and move the chest. This treatment was demonstrated upon a former asthmatic patient who had survived several months' manipulation, and one was certainly impressed with the fact that the patient had received his money's worth. This patient was now examined by the former osteopath, in a regular medical way. A very marked emphysema was found, which probably accounted for the more or less continuous dyspnea. Nasal examination revealed polypi obstructing respiration through the nose. The gastrointestinal tract was also examined in the search for the cause of the disease. This case impressed the exosteopath, the students, and the patient with the fact that there was a world of difference between osteopathy and regular medicine.

North well expresses the pathology of the condition with his asthmatic tripod: 1. A vulnerable mucous membrane. 2. Abnormally sensitive nerve centers. 3. An external irritant or exciting cause. A fourth postulate might well be added, namely, the presence in the body of known and unknown substances which are toxic to patients susceptible to asthma.

THE PROBLEM OF PSYCHIATRY IN THE FUNCTIONAL PSYCHOSES.*

BY

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of Boston, Mass.

[Concluded from page 169.]

To the inquiring mind the contradictory presentations of these matters are confusing and create difficulty. The subjects are, in their nature, complex, and our knowledge is limited, but much ambiguity is undoubtedly due to the lack of precision in the statement of the terms of

the problems. One of the most common obstacles to clear thinking appears to rise out of the fact that for every predicate implying action we had to think of an actor, or causative agency, and our minds habitually conceive of some form of personification of such an agent as possessing motor and motive attributes. Thus we think of life and death, and artists picture them, in human forms; we are prone to dualistic conceptions and the mind delights in such paradoxical phrases as there can be no death without life; no disease without health; no evil without good. The use of the active predicate abbreviates expression and enlivens speech. Professor Sanford,¹⁶ discussing the influence of physics on psychology, notes the fact that, as the result of man's long primitive practice, his habits of thought are objective, and the language he uses is saturated with physical connotations and metaphors. It is not easy for even the best of us, he says, to keep clear of this inveterate physical-mindedness and the subtle suggestions of language; we help out our thinking by material figures and feel a sort of dumb compulsion to make our psychological theories accord with physical requirements. Ebbinghaus is quoted as describing the older psychology as distinctly "mechanistic," many analogies from familiar material processes being used in the exposition of mental phenomena. In regard to essentials, Professor Sanford thinks it may be said that psychology has outgrown this method. But, turning to our own field of the medical sciences, the ruling tendency of our thought and language leads to the conceptions of "disease" and "process," for example, in terms implying immediate causative agents. The familiar conceptions of a process of anabolism and a contending process of katabolism in the cell are treated as the analogs of the life-process and death-process. The analogy is extended to include in this conception the fact that in the whole compound organism the anabolic processes overbalance the katabolic till middle life, when the two processes are more nearly in equilibrium, and that thereafter katabolism predominates more and more in the normal decline of old age. It is held that in the broadest sense the process of senescence begins with the beginning of life in a progressive diminution of the power of growth; and with the progressive waning of the vital powers the leading somatic changes accompanying old age are atrophic and degenerative. The same conception concerning the anabolic and katabolic processes is equally legitimate concerning the idea that an inherent tendency to degeneration is transmissible; the inherited constitutional weakness and diminution of vitality may be interpreted as belonging to the series of changes which imply a process of dying continuing through several generations.

There appears through all these reasonings the prevailing method of thinking in terms of "processes." The inquirer is moved to ask whether the normal processes of anabolism and katabolism are not both essential to the maintenance of a health-perfect cell and both, therefore, parts of the normal life-process? We do not think of the most healthily active cell as one most vigorously dying. If we consider the physicochemical changes in the cell inclusively as a process of metabolism it is consistent to think of the normal building up and

* To fill the vacancy in the program created by the absence of one of the principal speakers, this address was presented by Dr. Edward Cowles, Chairman of the Section of Psychiatry of the International Congress of Arts and Sciences, St. Louis, September, 1904, and subsequently revised by him from the outline then given.—Editors *American Journal of Insanity*. Published synchronously with the *Boston Medical and Surgical Journal*, by courtesy of the Editor.

breaking down of complex compounds in growth, work, and repair as harmonious and not antagonistic operations. Hering separates assimilation as only a qualitative chemical change from growth as quantitative, and in like manner dissimilation from atrophy. As to the transformations in the cells and the overwhelming number of substances excreted from them, little is known of the processes by which these are derived; but many products are formed in both the ascending and descending portions of the metabolic series. Disordered and imperfect adjustments of the molecular arrangements of living substance may affect and arrest both anabolism and katabolism; defect of the latter and not its predominance can be conceived as a cause of the death of the cell.

In physiologic theory the distinction is made between death of the tissues and somatic death; in the former, it is reasoned that constantly throughout life the molecules of living matter are being disintegrated and whole cells die and are cast away—and that life and death are concomitant; in the latter, death occurs when one or more of the organic functions is so disturbed that the harmonious exercise of all the functions becomes impossible. This distinction has been referred to, and further inquiries are suggested here. In respect to the death of the tissues, the "unit cell" being an organism of high complexity as to its structure and function and its life-process, is not failure of this life-process of the cooperative adjustments within the cell truly analogous to the failure of life or somatic death in the whole compound organism? In this connection the question again arises as to the concomitance of the processes of life and death, the latter being theoretically analogous to the constant disintegration of living matter. Hering's idea that assimilation and dissimilation are distinctly separate from growth and atrophy permits the former to be regarded as one intimately combined and normal metabolic process in a working cell, having no theoretic significance except as wholly contributing to the maintenance of the function of a health-perfect cell. The daily shrinkage of the working and fatigued cell may be regularly made up by rest and nutrition; this is not atrophy, either simple or degenerative, for the continuity of cell-life may be unimpaired and only the labile molecular inclusions be changed by normal use, which promotes the health of the cell. On the other hand, the function of growth being of a more primitive type would appear to contain the explaining principle of the life-process as contrasted with the work-process. Consistent with this appears to be the sharp differentiation made by Adami between cells which have the habit of growth and those which have the habit of work; these two functions cannot be exercised by the same cell at the same time, and a normal working cell may revert to the type of a vegetative cell. This implies that cells of the primitive type having only the function of growth, their "work" (in the common usage of the word) is without external manifestations of energy; but that the function of work, which is the power to store potential energy within and to produce kinetic energy in external work, belongs to the highly specialized cell as an acquired character which it may lose. This being true, we may understand that

assimilation and dissimilation, in the limited sense employed by Hering, constitute a special kind of inclusive metabolic process different from the molecular changes, perhaps less complex, productive only of growth. It is not conclusive that katabolism typically represents destruction of life, though it means changes of substance in which life exists. These considerations suggest questions that are not in harmony with the generally accepted theory of life and death as concomitant processes based upon an assumed analogy to the physiologic processes of the healthy living cell.

This inquiry is intended only to consider some examples of current theories with the question whether they can be resolved into more simple conceptions. The life-process being conceived as the one supreme "process" in living organisms, this implies its maintenance by causative forces; assuming each individual to be endowed with a given vital durability, determined by antecedent conditions and subject to modifications due to favoring or adverse influences, the life-process reaches its possible attainments and finally fails in the struggle for existence. Injury, interference with normal function, overuse and disuse, disease, and the causes of the changes of senility present alike adverse influences which the organism fails to overcome. We must speak of disease and use its meaning as referring to results in diseased parts, organs, or tissues; and we may commonly think of the word as implying a combination of disorders of functional activities which may or may not be associated with ascertainable structural changes. But it should be remembered that we are thinking of a patient and not a "disease." There is no disease-process; no causative forces exist in nature that induce and carry on processes of degeneration and decay; gradual failure is the summation of the failures of community work due to the complexity of the organism, each organ being subject to the harmful influences of the functional failure of other members of the community. There may be deterioration of function, and degeneration of structure in the sense of failure to maintain it; there may be also regressions or rather recessions of results, but no active pathologic "process" of going backward in the structural reductions called "degenerative." These considerations do not support the idea of a "physiologic old age," based upon the conception of a normal process of degeneration or decay as though the results of senile conditions in structural changes are different from disease. This doctrine of natural decay and death makes great trouble in dealing with senile conditions in medicolegal cases; and in like cases concerning degeneracy in earlier life the most contradictory and confusing notions prevail. They are not in harmony with practical experience. This is largely due to the adoption in psychiatry of generalizations in regard to heredity not yet warranted by the science of biology. The morphologic ideas in the prevailing pathologic conceptions, and the descriptive terms employed, have undoubtedly obstructed the progress of psychiatry. From all such preconceptions the psychiatrist should be wholly emancipated.

A functional conception of pathology is not in conflict with a pathologic conception in the sense of the long-used

distinction between functional and organic diseases. The objection to this is not lessened, but the fault is not with function. Life and the science of physiology are first; function and all that pertains to it are primary facts of the activities of normal life. Much disharmony in the conceptions of pathology has been due to the setting up of ideas of "organic diseases" as the chief factors in pathology, and the minimizing of function as worthy of serious scientific consideration. Our conceptions of function are uncomplicated as relating simply to the modes of action of the several parts of the organism; but we must think of organic disease in two ways, of changes of structure in results, and of changes of action in "process." The functional factors are necessary to organic disease and their distinction and true relation should be discovered in their combination. The organic changes of disease are the sequels of interferences with the prime process of normal life.

PHYSIOLOGY AND ITS RELATION TO PSYCHOLOGY.

Physiology acknowledges its debt to Johannes Müller, who mastered the two great sciences, morphology and physiology, and was a teacher of pathology. He took an active interest in psychology, regarding physiology by empirical methods as essential to advancement. After Müller's death, nearly 50 years ago, the fields of his scientific work were divided by the specializations through which the present marvelous advancement has been gained. Physiologic chemistry became independent of physiology; and physiologic psychology developed on the lines of psychophysical experiment. It was then that mental physiology should have made its union with mental pathology. It is easy to see that psychology tried to accomplish this by its attempts to find a morphologic basis for its investigations through the experimental method, but the field for this was limited. Psychiatry, under like limitations by its morphologic attitude, met the invitations of psychology with inherited distrust of a functional pathology; psychology was turned upon itself, and also, much of its own choice, sought and found open ways back into the attractive regions of the investigation of psychical function and philosophy. The latter phase of psychiatric interest in experimentation has been mentioned and is full of promise, but such movements require years of time. The method of exhaustive study of the clinical expression of psychic reactions through speech and behavior, and the use of experimental tests which bring out individual characteristics and their variations, are gaining a share, which must increase, of the attention and interest heretofore centered in the pathologic laboratory. This is a new and definite revelation of a tendency toward the study of a functional conception of pathology in psychiatry.

Psychology is still kept apart, however, from the practical study of mental pathology; this is probably, in part, its own fault; although some students of psychology have shown the requisite interest, there is a lamentable want of opportunity. What would really be the most promising interest in psychiatry should be found in the establishment, in hospitals for the insane, of true experimental psychology, with physiologic methods applied clinically, according to the principle of using instruments

of precision in other clinical work.* The observer of these clinical manifestations trained both as a psychologist and physiologist would find many new variations of phenomena not seen in the normal subject. A hospital for the treatment of mental disorders is a laboratory of itself where nature makes experiments in the excitation, suppression, and combination of naturally correlated psychic and physical reactions, giving many clearer displays of their nature, both by their intensification and absence.

Mental diseases are peculiarly and essentially constituted of mental symptoms; the study of their phenomena must refer them to mental physiology, for the laws governing vital phenomena under abnormal conditions are not different from those of normal life. The study of mental physiology under pathologic conditions should be helpful for both psychology and psychiatry.

This inquiry being assumed to be free from all preconceptions as to the true nature and place of mental pathology, and as to forms and names of mental diseases, it may be turned to an examination of the relations of psychology, or mental physiology, to all of the associated reactions of the physical organism. This is the necessary basis of pathologic physiology for psychiatry. Approaching the subject newly from this point of view, the physician should seek to inform himself concerning at least the immediate facts of mental function and the accepted postulates of psychology. But in preparation for such a study it should be recognized that mental physiology is included in general physiology as concerning a part of the vital activities of the living organism; also, that certain general modes of action in the body always have a part in mental function. Some of the symptom-factors of mental disorder have their genesis in conditions that affect primarily other parts of the organism than the brain. General physiology, therefore, claims the attention of the psychiatrist to certain essential principles, the importance of which can only be indicated here by mentioning some of those of immediate interest; the purpose is to present some of the physiologic reasons for the proposition that the problem of psychiatry lies in the functional psychoses.

A distinctive feature of modern biology is the fundamental conception of a living body as a physical mechanism (Huxley); underlying all the phenomena of the animal organism is the reflex action of the nervous system, and physiologists generally agree to consider every action as aroused by some cause or stimulus (Sedgwick); under the biologic conception man is an organism for reacting on impressions (James). The nervous and mental mechanisms being regarded as constituted of three minor ones, their action appears in a sensory—a central or transformation—and a motor process; in the central process part of the work done by the nervous system leads to consciousness; the response to a stimulus may be a muscular contraction, a secretion in a

* For an account of the beginning of the present laboratory methods, both psychologic and chemical, at the McLean Hospital in 1889, see "Les Laboratoires de Psychologie en Amérique," by E. B. Delabarre, *L'Année Psychologique*, 1895; also "Laboratory of the McLean Hospital," by G. Stanley Hall, *Am. Jour. Insanity*, 1895. The subsequent development of the pathologic laboratory and the clinical methods—of the laboratory for pathologic chemistry in 1900—and of that for pathologic physiology and psychologic experiment in 1904, constitute a true psychiatric clinic of a special character, designed from the outset for the investigation of the functional conditions of mental disorder.

gland, a vascular change, or even a trophic or metabolic influence—all pertaining to the centrifugal system. While reflex action is not conscious action, one may be conscious of the act, and in many cases conscious changes precede, accompany, or occasion the change. The most important reflex of all is commonly ignored, viz., that which provides for the constant readjustment of the parts of the system to each other, by virtue of which the entire mechanism is receptive even to minimal stimuli. This may be termed the *neuroequilibrium reflex*. The tone of the nervous system is this wonderfully complex adjustment of inhibition and stimulation. Every metabolic process in all the nerve cells exerts its influence on the entire nervous system. One of the most remarkable reflex associations is that between vasomotor alterations and the seat of the emotions, which are thus intimately involved with the viscera and vessels in their minute connection with the sympathetic system. This association has a most important influence in the mental sphere, though beyond this fact little is yet known of the physiologic basis of these reactions.¹⁷

The intimate connection of mental states and the physical reactions of the whole body are well recognized by both physiologists and psychologists; it is of fundamental importance in psychiatry. Lombard¹⁸ describes the cells of the central nervous system, during waking hours, as continually under the influence of a shower of weak nervous impulses, coming from the sensory organs all over the body; moreover, activity of brain-cells, especially emotional forms of activity, leads to an overflow of nervous impulses to the spinal cord and an increased irritability, or, if stronger, excitation of motor nerve-cells. There is a constant inflow from the environment of a vast number of excitations ordinarily disregarded by the mind, but all the time influencing the nerve-cells; the effect of this multitude of afferent stimuli, in spite of their feebleness, is to cause the motor cells continually to send delicate motor stimuli to the muscles and to keep them in the state of slight but continued contraction or tension of *muscle-tonus*. In these mechanisms is the seat of the kinesthetic sensations and the functional alterations that play so essential a part in contributing to the wellknown symptom-factors of the "sense of effort" and "inadequacy," and motor "retardation" and "excitation."

Some of the physiologists have given much study to the relation of mental and physical states. Sherrington's¹⁹ discussion of common and organic sensation and the contributing cutaneous sensations has an extraordinary interest for psychiatry. Common sensation is understood to mean that sum of sensations referred, not to external agents but to the processes of the animal body, and these sensations possess strong affective tone. Total common sensation is the result of many component sensations, and those that arise in internal organs and viscera contribute a great deal to the total sum. Affective tone is the constant accompaniment of sensation; every form of common sensation is based on perception of an altered condition of the body itself. In connection with this comes the fact that all forms of common sensation present significantly preeminent attributes of physical pleasure or physical pain; and all are linked closely to emotion.

The elaborate researches of many observers in recent years concerning the nature of the muscular sense, the senses of touch, pain, and temperature, and their special mechanisms, strengthen the common fact that their sum contributes to the effects upon mental feeling-tone. They are in their nature productive in part of the organic sensations. Ribot²⁰ has studied, more than anyone else, the psychology of the emotions and the logic of their mental and physical reactions; he describes the presentations in the conscious mind of organic sense as constituting a vast aggregate of impressions arising from within the organism and continually flowing toward the superior nervous system; it is this region of subject conscious-

ness that gives the consciousness of being—the sense of personality. The sensations from the special senses are intermittent, of high intensity, and small in volume compared with the voluminous though faint, continuous, and all-pervading commotion produced by the organic sensations. These are intense enough, however, to be susceptible in health of psychic interpretation as a sense of well-being; from their disorders and intensification come the sense of ill-being. These are the long-recognized changes of coenesthesia. Professor James has shown the intimate relation of the emotional tone to bodily states; and Professor Ladd makes clear the usefulness to psychiatry of a study of the affections and emotions in their relations to the train of ideas, and to the different bodily organs; also the reflex effect of the changes in these organs upon both the feelings and the ideas.

Underlying all these physiologic phenomena of the living organism is the primary attribute of irritability. All the functional phenomena being influenced, within normal limits, by changes of irritability in the central, peripheral, sensory and motor mechanisms, and these changes being dependent upon the processes of nutrition and metabolism, and upon conditions of use and disuse, rest and fatigue, etc., the alterations of functional efficiency in the associated reactions of mind and body make the study of cellular physiology imperative for psychiatry. Some of the most commonly observed and characteristic symptoms in mental diseases may be referred to such functional disorders in the physical organism.

The healthy organism being fully constituted in structure and function for its work, when put in use begins immediately to be subject to modes of action which are the effects of its own activities; in other words, the living organism acquires functional characteristics as the immediate effects of use. Some of the common physiologic laws have a special importance here because they govern the work of the physical mechanism and therefore of all correlated mental reactions, not only in health, but in disease, as long as any functional activity continues.

1. *Association and habit* are fundamental in mental life; in respect to the association of ideas it is not the ideas that associate but the elementary processes of which the ideas are composed; on the physical side the law reduces to the law of habit (Titchener). Memory is an associative process; mental reactions (including perceptions, ideas, emotions) are associated with their physical correlatives and motor consequences. Habit is closely related; it is the functional disposition to repeat organic processes. This law of association and habit applies to "organic memory"; thus "associative memory" is fundamental in, and unites, both psychic and physical reactions.

2. *Inhibition*.—The animal organism has a motor character. All sensations and mental states are motor; the entire neuromuscular organism, mental and motor, acts primarily as a whole, governed by the laws of association, and this is subject to control. "The phenomena of nervous life are the outcome of a contest between what we may call inhibitory and exciting or augmenting forces" (Foster). It is conceivable that all nerve-centers are normally at all times subject to continuous control or inhibition, and are maintained in a condition of mobile equilibrium by the opposition of this inhibition to their own inherent tendency to discharge (Mer-

cier). "Inhibition is an action which obstructs or impedes another action, and which weakens or arrests it if it was already in action" (Oddi). "Voluntary action is at all times the resultant of the compounding of our impulsions with our inhibitions" (James). "The inhibition of a mental process is always the result of the setting in of some other mental process" (McDougal). It may be said as a physiologic conception that in living substances there are conditions of cohesion and inertia by virtue of the anabolic tendency of its physical and chemical elements; this may be called *physiologic inhibition*, and it is the primary factor in the mobile equilibrium conservatively holding the balance against the tendency to discharge induced by constant external stimulation. The psychologic conception of the essential physical fact, is that one neural process inhibits another; it may be said that as a will-impulse implies a neural process, which may inhibit, or excite and augment some other mental or neural process, this may be called *voluntary inhibition*. The great importance of the study of inhibition, which is only indicated here, lies in its holding an equal and counterbalancing place in mental and physical processes.

3. *Energy of Muscle and Nerve*.—This refers to the principle of the storage and discharge of energy, and the biologic theory that functional activity of a specialized tissue depends primarily upon chemical changes in its individual cells. The fundamental idea is that in the resting state the cell elaborates highly complex compounds and that these break down to yield the energy by which the cell does its work; discharge and restoration of energy are common to both nervous and muscular elements. Hughlings Jackson characterizes the animal organism as "an apparatus for the storage and expenditure of nerve force." These principles are of essential importance in the study of mental disorders. Inasmuch as functional efficiency must be taken as a measure of the available energy, it should be expected that exhausting influences would reduce functional power. Such reductions characterize all forms of the functional psychoses, and the variations of their symptoms are consistent with this principle.

4. *Physiologic Use and Fatigue—Waste and Repair*.—The law of use includes the wholesome effects of those just cited; normal use develops functional activity and strengthens power, while disuse weakens function. Overuse begets fatigue, and normal fatigue presents mental as well as physical effects. *Physiologic fatigue* may be continued beyond the point of regular recovery by rest and nutrition; it then becomes the *pathologic fatigue* of nervous exhaustion or neurasthenia with the characteristic symptom-groups. A functional conception of the significance of these groups of mental and physical symptoms should stimulate not only such a precise observation of them as is needed to constitute "disease forms" and mature types, but should lead to their being analyzed and traced to their functional sources in the whole organism in accordance with the principles of general pathology. This method reveals the genesis in physical states of some of the most characteristic mental manifestations. Beginning with the fundamental attribute of irritability, for example, wide variations occur within

normal limits, but more striking and significant changes appear in all forms of pathologic fatigue and the functional psychoses; the irritable weakness and languor of neurasthenia, and the psychomotor excitations, retardations, and "confusions" of melancholia and mania are examples. The study of these alterations of irritability involves the whole problem of reflex-action and the mechanism of responses to stimulation of both mental and physical functions. It is to be recognized also that all of these reactions contribute to the sensory returns from the whole organism—from the viscera, muscles, and even the special senses including the special dermal sensations, to the central nervous system, constituting the kinesthetic and organic sensations. In mental physiology a functional conception of these reactions reveals their importance for an understanding of the genesis of emotional changes, and the alterations of the affective tone in states of persistent mental depression. The sense of well-being and ill-being depends upon these variations. Most important of all, because so completely neglected in psychiatry, are the bluntings and losses of organic sensations and the consequent effects upon the feeling-tone and ideation; in this regard attention should be called especially to a remarkable fact well established in physiology and psychology. It is evident that the normal irritability of nerve and muscle requires the maintenance of a certain chemical constitution; slight variations from this, temporary or continuous, alter or may destroy the irritability. Further, it is noticeable in most cases that the first step toward deterioration is a rise of irritability; the cause being increased or continued, sooner or later exhaustion supervenes, the irritability lessens, and is finally lost." These functional reductions of sensibility, in a wide range of varied degrees and combinations, are constant symptom-factors in psychiatry.

The relation of mental physiology having an essential importance for psychiatry, there should be a first reference of all mental symptoms to their functional sources in the organism as far as possible with respect to their correlation and association with alterations of bodily functions. By the genetic method study should begin with the minor changes from normal action; these alterations show intensifications and losses of function, and symptom-groups are modified by their varied combinations.

MENTAL PHYSIOLOGY AND THE FUNCTIONAL PSYCHOSES.

The true basis of a pathologic physiology in psychiatry is mental physiology and its physical correlations of function; variations of nervous and mental reactions in their initial stages may be wholly functional. Approaching the subject newly from this point of view the physician is assumed to know the modes of reaction of the nervous and mental mechanisms, and that part of the work done by the nervous system leads to consciousness; he should know also the primary postulates of psychology. Having to study the operations of other minds, he needs to distinguish in descriptive terms his own conscious experiences.

A helpful method in psychiatry is to separate the

experiences that relate to the outer world from those that belong to the inner life. Professor Sanford presents this idea in discussing the relation of psychology and physics, to which reference has been made. He describes the conscious experiences that may be called physical phenomena: percepts or series of percepts belonging chiefly to the sense-fields of sight, hearing, and touch, including under the latter the kinesthetic senses as well as pressure, heat, and cold; he speaks of these as the senses that mediate the "life of relation" with the world outside our own bodies—the "physical group of senses." Taste, smell, pain, the general and organic senses—all having little external reference—are not mentioned at all in physics, except incidentally. The method of psychology on the other hand, while not essentially different, has broader outlines; its phenomena are various conscious experiences, including all those with which physics sets out, but also experiences involving pain, organic and general sensations, feelings, emotions, memories, images, volitions, processes of reasoning—and everything that belongs to such experience. Physics, dealing with outer experiences only, practically works with terms derived exclusively from the kinesthetic and a part of the dermal and visual experience in its spatial function; these are the senses capable of perceiving matter in motion, and the physicist in using their terms excludes reference to the other senses of the physical group, sight, hearing, and touch. Psychology deals with both inner and outer experiences.

This general view of mental physiology has a special value for psychiatry which it is possible here only to indicate. The conception of a relation between conscious experiences and outer physical phenomena implies an organism, with its special "physical group of senses" in touch with the outer contacts, acting as a medium of transmission between the two; this medium may be conceived as forming also a *somatic group of senses* in the paths of communication. But this mechanism of transmission does not afford, even normally, open ways without friction or obstruction; to its report of contacts with the outer "life of relation" it adds the multitude of returns with all their variations from its own physical workings, and for this process the same mechanism of kinesthetic and other senses, in a new grouping with others, including the organic and general sensations, is used. In abnormal as well as normal conditions these returns, however imperfect, stand for the truth and the whole truth in conscious experience; in health we think as little as possible of the medium of transmission, and in all conditions of well-being or ill-being we can only describe our organic feelings in general terms. We do not recognize for the most part the sources of these sensations, yet they have a controlling influence upon our minds. These considerations indicate three groupings of the functions of the sensory mechanisms of conscious experiences: (1) The physical group of senses of the outer "life of relation"; (2) the somatic group of senses of the inner life—our conscious experiences of our own bodies; (3) the central psychic life, which includes both of the other groups of conscious experiences beside those belonging distinctly to its mental aspect. The interest of this to psychiatry is that comparatively little atten-

tion has been given to this inner sensory field of the sources of conscious experiences; yet, it may be said, here are the conditions and the very material of bodily and mental stimulations and sensations with which the mental work is done. These explaining principles have been almost wholly omitted from the accepted formulas of the conceptions of modern advanced psychiatry, which has chiefly concerned itself with the motor aspects of mental life and expression. These physiologic references are needed to explain many of the symptoms of the psychoses and should have their full value in the formulation of the principles of mental physiology and psychiatry.

A functional conception of mental pathology* directs observation to the first and smallest departures from normal action, upon the principle that all variations of a pathologic character are subject to the laws of normal function acting under abnormal conditions. The study of the development of symptoms is equivalent to noting the genesis and progress of the conflict between the functional energies and the abnormal conditions. Functional modifications as symptoms are the results in changes of action—organic effects are the results in changes of structure; by the genetic method the sequences of functional phenomena are noted; in the functional psychoses there are variations of functional efficiency manifested by its reductions and recoveries. The following characterization in outline of the psychoses is an application of the functional principles referred to in the foregoing pages. For the purpose of tracing the several orders of symptom-factors from their genesis in functional sources, they can be considered most simply under the divisions of the mental elements—intellect, feeling, and will, as these terms are used in modern psychology for purpose of classification.

I. THE FUNCTIONAL PSYCHOSES.—A study of the large group of cases of nondeteriorating mental disorder yields certain general conclusions as to what may result to the normal well-endowed individual when subjected to the effects of use, disuse, overuse, and stress. Beginning with the least degrees of decline of functional vigor, below normal fatigue, there is no point in the declension where a line can be drawn definitely marking a change from one named "clinical type" to another, down to the lowest degrees of vital energy and complete loss of voluntary function. Throughout all observations of these changes the essential principle of variations of irritability is never to be lost sight of, nor the fact that the first step toward deterioration of function is characterized by a rise of irritability. Another pervading principle is that among the multiple functional mechanisms failure of energy is unequal, and that changes and losses of irritability must apply as much to sensory as to motor function. The word "psychosis" can be used most profitably as correlative with "neurosis," and as including both its proper physiologic and pathologic meanings, leaving the differentiations of sanity and insanity to be indicated by these words. A basis of inquiry, as above described, prepares the way for the examination that comes first in order of the initial

* Cf. Barker, L. F.: "Methods in Medicine," Boston Med. and Surg. Jour., June, 1905. Referring to the value of a functional conception of pathology, it is also said that "as medicine has become more scientific, the mind has ceased to be satisfied with such descriptive classifications as the clinical symptoms and syndromes represent and with 'clinical types' set up, and is ever on the alert to replace them by classifications of a developmental or genetic character." Quoted from an address before the Massachusetts Medical Society, published while this paper was in manuscript.

departures from mental integrity, viz.: The affections called imperative and fixed ideas, and the primary asthenic conditions of neurasthenia before the after-effects of chronic states have supervened.

Insistent and fixed ideas refer to a wide range of kindred cases of affection that can happen to sound minds in persons neither temporarily nor constitutionally neurasthenic. The functional elements are normal and the affections may attain characteristic forms in normal minds; but this happens to them more readily when there is neurasthenic reduction of inhibitory energy and greater degrees of intensity and persistence occur in association with constitutional instability. All observant sane persons estimate the purposes of others by interpretations of their speech and behavior, and thereto fittingly adapt their own conduct influenced by inferences and judgments in a manner that would indicate "paranoid" suspicion under certain circumstances. Inasmuch as this is a universal, functional, self-protective principle, sane persons have normally the functional disposition to produce ideas of suspicion and persecution, but well-balanced minds control thought and speech. In any psychosis, however, associated with asthenic conditions there may be "paranoid forms" not belonging to that psychosis as essential to the symptom-complex; this reaction is liable to become casually intensified or further developed and fixed by habit. In many cases not "psychasthenic," nor physically neurasthenic, the affection is purely a functional accident; it may involve all forms of emotional reactions, other than "phobias," and many subjects recover.

Neurasthenia, in its early conditions, uncomplicated by the effects of habit, presents the same elements, in mild degrees of functional reduction, that characterize their greatly varied combinations in the symptom-complexes of the graver conditions of melancholia, mania and exhaustion psychosis or confusional insanity. These neurasthenic conditions may occur in all persons, under sufficient stress, but when there is constitutional weakness the power of resistance is less. The functional elements of the organism, all working together, constitute combinations of community-work of extreme complexity; these elements being unequally reduced in efficiency the "clinical types" are very much varied. A method of analysis of symptoms with the endeavor to estimate their functional values and their relations to their physiologic sources will appear under the following topics:

The functional psychoses constituting the main group of nondeteriorating affections pathologically regarded as insanities, all have a basis of some kind or degree of asthenic reduction of functional efficiency; as already indicated, these may include the whole range of degrees from simple cases of nervous exhaustion downward through the simple and pronounced cases of melancholia and mania, including all varieties of phases and combinations of the symptom-elements; also including the more actively induced exhaustion psychoses and confusional deliriums. Functionally considered, it is proper to regard all these cases as "functional psychoses" until proved to the contrary. Function comes first as the present criterion; organic change is a result. Cases carefully diagnosticated characteristically tend to recovery. The designations, neurasthenia, melancholia, mania, etc., are simply valuable descriptive terms; they are thus not correct names of diseases as clinical types and we have yet to study broadly the genesis and development of these conditions. By the functional method we have merely advanced, as yet, little beyond the general fact that two classifications may be made of the psychoses—the nondeteriorating and the deteriorating. By the morphologic clinical-type method there is a singular lack of success in adopting principles of valuation of symptoms by which men of good minds can reach like conclusions. We are not yet ready to determine species; this should be aided by the study of the genetic character of the symptom-elements.

The significance of the unifying characters of the nondeteriorating range of psychoses may be made much clearer by grouping them according to the functional sources of the symptoms and their own natures. The symptom-factors thus fall into natural groups, which should be studied with complete freedom from preconceptions of "disease-forms." No more is attempted here than to harmonize these groups with the elementary postulates of psychology, and with the general physiologic facts heretofore cited.

1. *Feeling* (the feelings and emotions).—The emotional variations that are pathologically persistent are in close relation with the changes of bodily states which are represented in the central nervous system by the organic, kinesthetic and general sensations; the sum of these has, physiologically, a strong influence upon mental feeling and therefore in pathologic conditions the emotional tone of the psychic sphere corresponds with the sense of personality by "states of mental depression" (melancholia) associated with malaise and ill-being, and "states of mental exaltation" (mania) with sense of well-being and false euphoria. The complex sources of the sense of body have been described and the changes of irritability due to fatigue and other causes; the consequent variations of the sense of physical pleasure and pain are closely connected with the rise and decline of irritability, its intensifications and losses, but not with parallel changes.

In the emotional states of "neurasthenia" the depression is variable; of "melancholia," persistent; in both the feeling-tone may be combined in various ways with the first degree of functional deterioration of irritability marked by agitation, restlessness, "irritable weakness" (psychomotor excitation), or by dulness, slowness, languor (psychomotor retardation). In nervous exhaustion and melancholia the feeling-tone is constantly influenced by bluntings and losses of organic sensation, strikingly shown in the loss of the sense of fatigue—"fatigue-anesthesia," and the various unequally distributed conditions described in the natural order of decline as hyperesthesia, hypoaesthesia, paresthesia, and anesthesia; also ease and obstruction of motor expression have their reflex influence upon the affective states as in a feeling of facility, or the "sense of inadequacy" and the "sense of effort." Hopelessness, introspection, retrospection, apprehension, self-reproach, are logical consequences. All these variations are persistent intensifications and differences of the normal connections of ideas and emotions, with their correlated physical reactions; the persistence of morbid emotional reactions indicates deteriorated body states.

In the emotional states of "mania" there is the characteristic exaltation and exhilaration; but in many cases there is depression of feeling of the type shown by anger in its origin from painful states of irritation, and by distressing delusions and aggressiveness. These two prominent types of feeling-tone are associated with corresponding variations of irritability marked by its rise from moderate to high degrees of psychomotor excitation, shown mentally in "flight of ideas," corresponding to the agitation and irritable weaknesses in melancholia—sometimes more extreme and sometimes reduced and lost. The clinical pictures in some cases may indicate a simple absence of painful irritation, but they certainly show, characteristically, the false euphoria of blunted sensations, as in alcoholic intoxication.

2. *Intellect* (sensations—perceptions and ideas).—The "thinking process," as it is rather vaguely called, may be definitely conceived to include the ideational reactions of the stream of consciousness, constituted of the association-processes in combination with the inhibitory or exciting control of the will working through attention and apperception; the emotional factor enters into the combination and modifies the "thinking process" with intensification of interest and motive influences. It is impossible to describe these function-factors separately because they all work together. The

character of the ideas—the sensations revived by memory in the association-process, whether depressed in melancholia, or exalted in mania, is in harmony with the emotional tone as it is “lowered” or “exalted.” The time element in the processes of the stream of consciousness varies with the rise in irritability and especially with the coincident reduction of inhibition. This, in mania, with the intensification due to irritability, produces “flight of ideas” with quick reactions and superficial associations. The tendency is to increasing weakness, reduction of clearness, incoherence, and final arrest of mental functions in confusion or stupor. With disordered perceptions there are illusions and hallucinations; delusions arise. Maniacal states represent graver degrees of derangement than melancholia, and a lower level of functional reduction, especially of inhibition. The more profound conditions of acute exhaustion (confusional insanity, exhaustion psychoses) occur sharply by themselves from strongly exhausting influences and are varied manifestations of delirium; these may supervene in the severer types of both melancholia and mania.

3. *Will* (inhibition—attention and apperception).—In the sense that acts of the will are such acts only as cannot be inattentively performed it produces exciting or augmenting effects in the “thinking process,” or inhibiting effects; working through attention and apperception its function of control appears in voluntary inhibition, and this has been described in part in connection with the other elementary functions and in the reference to the physiologic law of inhibition. Normally inhibition, both physiologic and voluntary, stands in mobile equilibrium with the tendency of all conscious and neural excitations to discharge into motor effects, open or concealed within the organism. In the incessant change and succession in the train of ideas in consciousness the attention holds the chosen or attracting idea in the interplay of neural processes and thus inhibits its tendency to pass away, other items being held with it in reasoning, and apperception being a special form of the same controlling influence. This inhibitory function is a true index of the integrity of vital energy; it is regularly reduced in efficiency with asthenic reduction of the nervous forces. Voluntary inhibition is variably reduced in neurasthenia, persistently in melancholia, and greatly so in mania with loss in delirium.

4. *Organic Sensations and States* (general and kinesthetic sensations).—The importance has been shown of these function-factors of the “somatic group of senses” in respect to the representations they bring into conscious experiences concerning the inner physical life of the body. In health the sensory and motor reactions of our bodies and our conscious experiences are adjusted to contacts with the environment within normal limits; the organic and kinesthetic senses normally contribute to the general welfare with only salutary interferences, and these being mostly unnoticed, we habitually ignore their existence. It is in disordered physical conditions that the abnormal influences arise and interfere with and derange the experiences of the mental life; they are general and vague in character, but are of essential significance, though only described as subjective experiences. The phenomena of changes of excitability and loss of function may be variously described; an interference with the functions of any one system will disturb the normal functional equilibrium that must of necessity exist in the action of the whole.²³ The principle of localized variations of irritability, as in the neurones, applies to all functioning groups of cellular mechanisms; the threshold of excitation may be raised or lowered in any of the sensory, motor, or central and psychic parts of the reflex mechanisms. Upon these changes may be predicated all the phenomena of psychosensory and psychomotor excitation and retardation, conditions that appear in some kind or degree in the whole range of the functional psychoses. These variations may be ascribed to reductions of the nutritional

maintenance of the vital energies. Hyperesthesia and hyperkinesis are the complementary manifestations that betoken fatigue, or equivalent weakness from some cause, of the physiologic inhibitory energy; this condition is often associated with anesthesia of the fatigue-sense in the same case.

It should be noted that the changes of feeling-tone, of motility, and of control do not run parallel to each other; hence the differences of the clinical pictures presented by typical melancholia and mania and the so-called “mixed cases”; melancholia presents two principal types—emotional depression with excitation and retardation; mania presents emotional exaltation with excitation, and sometimes there are painful states of consciousness and the acute reductions of function in exhaustion and stupor. There are numerous phases in the unified melancholia and mania as constituting one general group of variations of functional disorders presenting clinical phenomena apparently widely divergent as “clinical types,” but falling into harmonious relations when explained consistently with their developmental and genetic character.

II. THE DETERIORATING PSYCHOSES.—These psychoses have an important relation with the *functional psychoses* that should be mentioned here. They are characterized by persistent functional deterioration and tend to dementia; this is consistent with the opposing fact that the vital energies of the life-process sometimes appear to overcome in recovery the interferences with their normal action. It has been said that the functional psychoses tend to recovery; yet the failure to recover in some cases may be consistently referred to constitutional weakness or the loss of vigor in old age. This does not imply that heredity is an essential cause of mental disease; “neuropathic” persons have less endurance against all adverse influences. Among the *deteriorating psychoses* the first place is given to a large group called “*dementia præcox*”; its general form is not clearly differentiated nor its special divisions; no common basis is implied in the designations hebephrenia (mental weakness), katonnia (motility disorders), paranoid forms (insistent and imperative conceptions). A single case may change from one “form” to another, and the recognition of some constant characters is required to unify all the “forms”; the common fact of dementia is shown in the deterioration of capacity that may occur in any of the functional mental elements, varied in different cases; this implies structural changes. The character of the failure is revealed in the quiescent states after the subsidence of active symptoms. The most common fact is the deepseated deterioration of the emotional nature; hence the characteristic indifference and apathy which favors the development of habit automatisms, etc. Concerning this large group of deteriorating psychoses, regarded as above stated, and including also the few other “disease-forms” at present accepted as such, some general conclusions now appear with respect to the functional psychoses.

The unification of the functional psychoses can only be indicated here with respect to the explanations and conclusions reached during some years of teaching the principle that each of the groups conveniently designated neurasthenia, melancholia, mania, etc., simply includes variations in combinations of different degrees of functional disorder of the same physical and mental elements. The essential unity of melancholia and mania was recognized by Griesinger and others with differing explanations; modern physiology and psychology broaden and simplify the whole subject with better explanations of general principles.

In recent psychiatry there is an evident tendency to the unification of the psychoses.

A significant contribution has been made by Dana;²⁴ in his large neurologic experience he has seen much to favor the idea that most neurasthenias are mental cases, or noninsane psychoses; the term phrenasthenia is used for a special group of neurasthenic or degenerative psychoses, including mainly those described by Janet as psychasthenia; it is said that an innate constitutional weakness underlies all the chief nonaccidental functional insanities. There is much reason for a simplifying psychiatric conception, complementary to Dana's view, that not only most, but all functional mental cases are subjects of asthenic reduction of functional efficiency and are neurasthenic. The tendency is notable in the remarkable studies of Janet, in which he reaches the conclusion by psychologic analysis that many of the apparently diverse psychoneuroses may be unified under the one principle of psychasthenia; this implies a general and special insufficiency in all the phenomena and is at the same time neurasthenia; these affections represent regular degrees of lowering of functional efficiency.

The genetic method leads to a comprehensive view of all the psychoneuroses. Considered biologically and physiologically neurasthenia, phrenasthenia, psychasthenia and all the functional psychoses are modifications of functional characters. Whether these modifications were acquired newly by the individual himself, or by his ancestor and thereafter transmitted as though they were inherent variations, the problem is essentially the same. However perverted, distorted and anomalous the functional phenomena of vital activity may be, they must be traced back to the first interferences with the physiologic elements to find their explanations in their genesis. We may assume that all normal adult individuals are subject to certain acquirable functional modifications—numerous and complex, thus forming the symptom-groups called neurasthenia, melancholia and mania, for example; all abnormal persons are subject not only to the same changes, but to something more and something different, and these additions may be simply special variations of intensity, or degrees of impairment, or of differences pointing to other than functional explanations. A general principle in mental pathology may be derived from these considerations. Whatever the form of a deteriorating psychosis it has its own pathologic characters; but superimposed upon these symptom-factors, and relatively superficial, neurasthenic manifestations commonly appear, and there may be episodes more or less transitory of manifestations of the functional psychoses. This occurs notably in the early stages of dementia præcox and manifests the practical occurrence of two diseases, viz.: The permanent deteriorating psychosis and the transitory phases (melancholic, maniacal, and paranoid) of the functional psychosis. This principle accounts also for the fact of there being maniacal as well as melancholic types, and the "paranoid conditions," in the "involution psychoses"; this principle is already well recognized in respect to the neurasthenic melancholic and maniacal modes of onset of paresis; and to the same types of functional disorder, and tendency to obsessing suspicious and delusional ideas, in senile insanity in which active symptoms may measurably or wholly disappear. All the psychoses

called functional for purposes of classification, and being nearest to normal, constitute the main division of the psychoses (considered as mental disorders); all the psychoses called deteriorating and being exceptions to the others, constitute the minor division. In these the fact that in some particulars the reductions of functional efficiency remain permanently deteriorating constitutes dementia, which implies some form of structural change, though none strictly characteristic has yet been found. The pathologic principle here suggested leads to a practical method of analysis of the symptom-factors of all possible forms of deteriorating psychoses. The first step is the distinction of the purely functional modifications referable to physiologic sources; these relate to variations of the fundamental irritability as explanatory of changes of motility and of the sensibilities and emotional tone, all being comprehended broadly in relation with the "somatic group of senses"; closely kindred with these are the reductions of function of the processes of association, memory, attention, inhibition, etc. Holding apart these phenomena of the main division of psychoses as being included in the functional conception of their pathology, and as explainable through their genetic and developmental character, there remain, of the symptom-factors of a deteriorating psychosis, those that point to the causes of the special deterioration. This helps to define the problem of research for anatomic explanations. It should not escape observation that when there is "innate constitutional weakness" in cases belonging to the main group of functional psychoses, special modifications may be noted in the symptom-factors, especially of the attention and inhibition element whose reduction is the most constant and characteristic fact of constitutional insufficiency. It is in these conditions that the law of habit has its most potent and perpetuating influence.

The functional psychoses, including those answering to the definition of "a typical form of insanity," present some points of special interest when analyzed in accordance with the method and principles examined in the foregoing pages. Reference has been made to Griesinger's descriptive definitions of melancholia as "states of mental depression" and mania as "states of mental exaltation." During more than half a century these designations have held their places in psychiatry; the search for more satisfactory statements has not been altogether successful. The difference of the emotional tone is the criterion but it is not a wholly true one. The depression in melancholia is consistent because the "somatic senses" retain enough of normal function to report truly to consciousness the fact of ill-being of the body; but in mania the exaltation is not constant, the physical correlatives of the feeling-tone are more disordered by reductions and losses yielding more irritating excitations and in many cases a fictitious sense of well-being. But the "somatic senses" produce other equally important symptom-factors in the changes of motility; in melancholia with impaired inhibition there are both psychosensory and motor excitations and retardations—in mania, with graver changes and losses of inhibition, motility is more disordered. The word melancholia, by long usage and observation of the facts, really stands

correctly in the recognition of its meaning of all its wellknown symptom-factors other than emotional depression; the word mania meaning madness, stands equally well for both its emotional variations and its motor excitement. In mania there is graver derangement of the "thinking process" and its "states" are at a lower level of reduction than melancholia. These references though meager serve to show that the terms melancholia and mania are well understood as including a great variety of states of varied combinations and proportions of their symptom-factors; beside the many typical cases of each group there are found to be very many "mixed cases." There are many phases, and a two-phase conception to represent the original groups of "states" does not hold good; for example, taking out the emotional depression from one group, and the motor excitation from the other, in order to designate the distinction of the phases and to characterize the compound "disease-form," leads to the exclusion from it of the very essential psychomotor excitation often associated with the depression in the former group, and to overlooking the significance of the emotional changes in the latter. An adequate study of the "somatic group of senses," as suggested here should help to clarify the whole matter. Compound designations for the unified symptom-groups yet suggested do not satisfy the requirements so well as their simple combination in "melancholia"—mania. The psychoses cannot be limited to the insanities; we must speak of the "noninsane psychoses," and in psychology the word refers to normal function. It might be said that the first step in the classification of mental diseases discovers two great divisions: *functional insanity* and *deteriorating insanity*.

This discussion of the thesis that the problem of psychiatry is in the functional psychoses required first an examination of the terms and conditions of the problem. This necessitated an inquiry concerning certain principles and conclusions of the biologic and medical sciences that have had a controlling influence in psychiatry. Morphologic conceptions being dominant in medicine, it was found also that a number of terms and phrases are so commonly employed in medicine that their use has been compelled in psychiatry, although they embody conceptions and theories inconsistent with its dependence upon functional conceptions of mental pathology. The inquiry having led to the conclusion that the physiology of the life-process is the first recourse for psychiatry in the search for explaining principles, it becomes necessary to be emancipated from all preconceptions. The functional conceptions, being framed, and applied consistently with the facts of physiology and psychology, lead to a recognition of the developmental and genetic character of the functional modifications, and indicate their sources in physiologic facts. A clearer idea is gained of the relation of conscious experiences to body states, and of the influence of the "somatic group senses" in the relations of the conditions of the whole organism to the mental states. The dependence of all functional phenomena upon the processes of nutrition and metabolism for the maintenance of the nervous and mental mechanisms, points to the fundamental importance of pathologic physiology and chemistry. Physi-

ologic and psychologic experiment in the immediate clinical examination of functional modifications shown in symptoms helps to determine the physiologic sources of the contributing disorders in the whole body as well as the central nervous system.

The psychiatrist inclined to inquiry finds, in the pursuance of his practical work, that as a physician he must treat the whole body, and that a functional conception of mental diseases leads to treatment. Psychiatry belongs to general medicine, and mental disease, like bodily disease, is not an entity nor an agency, but the result of normal function acting under abnormal conditions; the problem requires the investigation of the developmental and genetic character of functional modifications.

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THE TREATMENT OF MEDIASTINAL CARCINOMA WITH THE RÖNTGEN RAYS.¹

BY

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The treatment of carcinoma after it has extended to the mediastinal glands has always seemed a hopeless task, and must still be looked upon as a very grave condition, with little hope of cure. However, the good results obtained in the treatment of other deepseated malignant diseases has led me to hope for possible good results even in this late stage.

I have treated at least six patients with carcinoma of the mediastinum, secondary to carcinoma of the breast, and the results are at least encouraging.

The first undoubted case was referred to me by Dr. Charles P. Noble.

CASE I.—The patient was a white woman, aged 36. Dr. Noble had removed her right breast for carcinoma in the fall of 1902, doing a complete operation. The patient returned after 16 months with a marked recurrence involving the scar, extending into the axilla, and into the mediastinum. Dr. Noble removed all of the carcinoma possible, but he could not remove all of it from the axilla, without amputating the shoulder. This he did not think advisable, because of the mediastinal involvement.

Six weeks after this operation, röntgen ray treatment was begun, April 14, 1904. At this time there was some induration in the axilla. The evidences of involvement of the mediastinum were a dry cough, a prominence in the region of the sternum on a level with the second interspace, over which the skin was red, and an

¹Read before the annual meeting of the Pennsylvania State Medical Society, September 28, 1905.

area of dulness extending one and one-half inches to the right of the sternum on a level with the second rib. There was also some tenderness on pressure over this area. The patient had also been examined by Dr. Lessing, the family physician, and by Dr. W. H. Noble, who concurred in the diagnosis. Röntgen ray examination showed the shadow of a new growth on a level with the second rib to the right of the median line. A small nodule about one-half inch in diameter could also be felt in the left axilla.

She was treated every day except Sunday for five months, with a high vacuum tube at a distance of from 15 to 18 inches. Each exposure lasted from 20 to 30 minutes, with one milliamperage going through the tube (röntgen ammeter). There was some tanning of the skin, otherwise no ill results developed. At the end of this time the physical signs of the mediastinal involvement had distinctly diminished, the induration in the right axilla had disappeared, and the gland in the left axilla had been reduced to one-half its former size. The patient's general condition was good and she was able to visit the World's Fair at St. Louis.

Since these first five months she has been treated two and three times a week, except during several intervals, varying from one week to two months. In spite of this great amount of treatment no bad results developed, not even a dermatitis, until June, 1905, when from some cause or other a dermatitis of the first degree developed. At this time pains had again developed in the chest, there was slight swelling of the left side of the neck at times, and soreness and slight dulness developed to the right of the sternum on a level with the second interspace. These signs and symptoms have again disappeared under treatment. During all this time the patient has gone about her ordinary household affairs, and has at least been able to get a moderate amount of enjoyment out of life. She is still somewhat anemic, and has a cough which seems to be due to a true bronchitis. Without röntgen ray treatment it is not likely that this patient would be alive.

This case demonstrates, at least, that the röntgen ray has a beneficial effect upon deepseated carcinoma.

CASE II.—Woman of 61, was referred to me by Dr. Ernest Laplace. In 1900, he did a complete operation for carcinoma of the left breast. Two years after the operation, pains began to develop in the left axilla and arm. When she returned to Dr. Laplace three years after the operation, two nodules were found in the scar one-half and three-fourths of an inch in diameter, respectively. They were indurated, firmly adherent and tender.

After three months under röntgen ray treatment she was apparently well, the nodules and all other signs of recurrence having disappeared. She then left for a six weeks' trip to California. When she returned she had severe pains in the left arm. She complained of numbness, and had little use of the left hand. No nodules could be detected anywhere. There was some firmness in the left supraclavicular region. I believed the pains and the paresis were due to pressure of deep cervical glands upon the cervical plexus, and upon this theory gave her active treatment in the left supraclavicular region, with the result that in two months she again recovered. She then left for her summer home and returned in three months with severe pains in the left arm, so great that she required morphin; there was no grip in the

left hand, but she could raise the arm to a level with the shoulder. Numbness was complained of, but no actual loss of sensation could be detected. Increased firmness was again found in the left supraclavicular region. The patient had a dry, irritative cough, and dulness could be detected in the region of the upper portion of the sternum extending one inch to the left, which I believed indicated mediastinal involvement. Dr. Laplace concurred in this opinion. After two months' treatment she again recovered. She was treated at intervals during last winter and until June, 1905, when she again left for the summer, apparently well.

In this case, I believe that the pains, numbness, and loss of strength were due to enlargement of the deep cervical glands, which pressed upon the cervical plexus. These symptoms as well as those referable to the mediastinum disappeared as the result of the röntgen ray treatment.

CASE III.—A white woman of 63, was referred by Dr. Ernest Laplace, who removed the right breast in March, 1903. She returned 15 months after the operation with a recurrence upon the sternum, half the size of a hen's egg, which had been growing for several months. It was indurated, firmly adherent, and tender. There was dulness beyond the superficial involvement which suggested mediastinal disease. Röntgen ray treatment was begun June 6, 1904. She lived out of the city and was, therefore, only treated twice a week. After two months the growth seemed to be smaller and softer, but after three months the superficial portion had ulcerated, there was an increase in the extent of mediastinal disease, and septic symptoms developed, making her bedfast. I believe she is not living.

This patient was not treated often enough to give her a fair chance, but she probably would not have lived anyway.

CASE IV.—A white woman, aged 52, was referred to me by Dr. Elizabeth Peck. The patient had been operated upon three years before for carcinoma of the breast by Dr. Willard. She remained well about three years. In September, 1904, she began to have dyspnea. This was followed by intercostal neuralgia, difficulty in swallowing, and a mass in the upper sternal region. Physical signs showed this mass to extend two inches on either side of the sternum, and it caused the sternum to bulge forward. She was much cyanosed.

Röntgen ray treatment was begun October 10, 1904. Very little was hoped for in this case, but for some reason or other the patient was made more comfortable almost immediately. There was less dyspnea and less pain. This may have been due to relief of congestion. After four months of daily treatment she had improved in all of her symptoms and physical signs, and we thought she might possibly get well. At the end of another month, however, she became very weak, and treatment was discontinued. In July, 1905, four months after discontinuing the treatment, Dr. Peck noticed symptoms which indicated cerebral involvement.

CASE V.—A woman, aged 62, was referred to me by Dr. Peck, who had operated upon her in May, 1903, for carcinoma of the right breast. A complete operation was done and the patient made a good recovery and remained well for a year and eight months. Then within two months, the patient developed a mass beneath the

sternum about three inches in diameter. There were several other glands varying in size from one-half to one inch in diameter, located beneath the sternocleidomastoid muscles, and about the trachea. She had difficulty in swallowing, marked dyspnea, and could not speak except in a coarse whisper. She was weak, had considerable cough, and complained of a burning sensation in the throat. She was passing one gallon of urine a day, which gave no evidence of diabetes mellitus. The radiograph showed a growth three and one-half inches in diameter. Röntgen ray treatment was begun April 18, 1905. Little was expected in this case. Treatments were given every day for six weeks, then three times a week. After three months the swelling in the glands in the neck had practically all disappeared. The physical signs showed marked improvement in the mediastinal growth, but the radiograph showed only a decrease to two-thirds of its former size. During the next month, however, she became weak and later bedfast. At this time she was passing two gallons of urine a day. She died four and a half months after beginning treatment. There was distinct temporary improvement at first, but as a whole the results must be considered negative.

CASE VI.—This patient was referred to me by Dr. Mary Griscom, who had removed the right breast of the patient five years ago.

In January, 1905, the whole right breast became painful, and continued to grow worse until August 1, when Dr. Griscom removed a recurrent growth from the region of the original scar about the size of a hen's egg. The patient was sent to me within a week after the operation. At this time she had a dry cough, and an area of dulness was found to extend one inch to the right of the sternum on a level with the first interspace. This was recognized by both Dr. Griscom and myself. The patient looked more cachectic, and was weaker than should occur from a recurrent nodule in the breast. Röntgen ray treatment showed several enlarged glands in the mediastinum.

She has been treated three times a week. The wound healed nicely. The area of impaired resonance in the region of the sternum has disappeared. Her general condition has improved very much, and in fact she feels well, and is doing her usual housework.

As a whole, this line of treatment offers more than can be hoped for from any other line. When dealing with otherwise hopeless cases we cannot hope for a great percentage of cures. In all of the cases there has been improvement. Three patients have died. Three patients are either well or nearly so. Even if they never get well, their life has been very much prolonged and made more comfortable than could have been done by any other means. The cases of the three patients who died were too far advanced to hope for a cure. Sufficiently good results have been obtained in these cases to justify us in recommending the use of the röntgen ray early to such patients. Beyond a doubt it has been shown that the röntgen ray can affect deep-seated disease without destroying the superficial tissues.

Germany's Physicians.—With 29,200 physicians, Germany has one for every 1,700 inhabitants. In the city of Berlin 46% of all the physicians have an income of less than \$700, and 5% of the whole number do not have sufficient income to return it for taxation.

CASE OF CEREBROSPINAL MENINGITIS: A PLEA FOR MORE THOROUGH EXAMINATION OF THE SPINE IN CASES IN CHILDREN WHICH APPEAR TO BE PNEUMONIA.

BY

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In reporting the following case of cerebrospinal meningitis, it is not so much my intention to invite attention to any new or startling features in the case as to attempt to impress on the profession the oft-repeated, and as oft-forgotten, or neglected fact, that the only way to win these seemingly hopeless cases is to fight them through to the end, and never to give them up until the victims are so dead that there is no possible chance for doubt as to the final termination of the case. I would also call attention to the necessity for great care in determining the diagnosis in all cases in children in which the trouble would seem, at first sight, to be pneumonia.

Preliminary to the report of the case, for which purpose this paper is written, let us review the history usually obtained in a case of meningitis. In my experience, the following is the story commonly told by the parents, or those who stand in their stead:

The child has been sick for several days, and has been treated with home remedies, or with some medicine which has been in the house, or some patent or other unprescribed preparation. It has not improved under this treatment, and the physician is called in because the child is worse, or has had a convulsion, or "the light hurts its eyes," or there is some other feature which alarms the responsible adults.

Examination of the child shows that it appears to have pneumonia, or some allied lung complication, and too many of us, and particularly the very busy practitioners, are prone to stop here, accepting a diagnosis which appears to account for all or most of the symptoms. Then, too, there is, unfortunately, the old, rooted idea that meningitis is a rare disease. It is my firm conviction that many a case of "pneumonia" which proves fatal was in reality meningitis, and that the enormous percentage of mortality in pneumonia among children has been due, in many instances, to unrecognized meningitis. In every case of acute lung involvement in children a careful examination should be made of the spine and neck and eyes, and thus these cases of meningitis will be recognized. Pressure over the spine and at the base of the skull will bring out the tenderness in the cervical and dorsal regions. Examination of the eyes will sometimes, not always, show some inequality in the pupils, and the presence of photophobia. The finding of these symptoms in a case that appears to be pneumonia will put a totally different complexion on the case, and will change the entire outlining of the treatment. If the diagnosis of meningitis is not made early, and the treatment directed toward the control of this complication in its early stages, it is hopeless indeed.

The following case is instructive, in that it was practically a typical case, both in its preliminary history and in its clinical aspects.

R. F., female, white, born in United States, aged 6 months. Bottle-fed from birth. A fine, rugged child.

Family History.—Negative.

Previous History.—Negative.

Present Illness.—Child has had a "cold" for several days and has been given a cough mixture, which was prescribed for it in a previous illness. It has failed to improve, and on June 1 refused its milk and was very nervous, crying out a good deal, particularly after coughing.

Examination.—The face is drawn; alas of nose distended; dyspnea; cyanosis; considerable coughing, the child crying after each paroxysm. Head slightly drawn back and a slight tendency to roll from side to side. Child is very nervous, movements of extremities being at times almost convulsive in character. Pupils equal. No photophobia.

Percussion and auscultation show consolidation of the lower and most of the middle lobes of both lungs, with bronchial breathing.

Temperature, 103.2° F.; pulse, 182; respirations, 56.

Diagnosis.—Cerebrospinal meningitis, with its concomitant pneumonic complications.

Treatment.—Hot applications applied over the whole of the thorax, extending well up the back, dressing to be renewed every 12 hours. Calomel with pulverized ipecac and opium, .065 gm. (1 gr.) of each, given at once, and minute doses of tincture of aconite, tincture of belladonna, and tincture of bryonia, to be given at frequent intervals.

The condition seemed to yield nicely to the treatment, the temperature falling to 99°, and remaining between that and 100° during the next few days. The nervous system was kept quiet with heroin hydrochlorid and ergot was administered in doses of from .06 cc. to .18 cc. (1 m. to 3 m.). It began to look as if we would be able to control the condition, when on the afternoon of June 5 the child refused its milk, which it had been taking pretty well again, and became very restless, crying out a good deal, the cry having the wellknown "brassy" quality. The head was rolled from side to side at times and there was considerable tendency to opisthotonos. During the night of June 5 the patient was very restless and the respirations were irregular in rhythm and in length, but not of the Cheyne-Stokes type. Heart action was very feeble and irregular. Although apparently contraindicated by the meningeal condition, strychnin sulfate .2 mg. ($\frac{1}{500}$ gr.), with atropin sulfate .1 mg. ($\frac{1}{100}$ gr.), was given hypodermically at about 1 a.m. of June 6, when the temperature was 103.4° and the patient was badly cyanosed. This injection was repeated at about 4 a.m., when the temperature was about 106°. At this time a sponge bath was given, beginning with tepid water and alcohol, which, when it failed to reduce the temperature, was changed to ice-water. This reduced the temperature to 99.3°, and at about 6 a.m. I gave 1,500 units of diphtheria antitoxin, a line of treatment pursued by Dr. H. V. Logan, of this city, and myself for a period of over three years; 6,000 units were given in the 30 hours beginning with 6 a.m. June 6, and this agent was then discontinued, because of its unfavorable action on the patient's heart. One hour after the sponge the temperature had risen from 99.3° to 100.1°, and an ice-bag was applied to the back of the neck, being removed at 10 a.m., when the temperature was 98.4°. From 10 a.m. to 11 a.m. the temperature rose from 98.4° to 101°, a rise of 2.2° in an hour. The ice-bag was reapplied and was kept on continuously when the temperature was above 100°. The medicinal treatment consisted of triple bromid in .32 gm. (5 gr.) doses, with ergot in doses of from .06 cc. to .18 cc. (3 m. to 5 m.) every two hours. This treatment had to be discontinued after about 30 hours, because of the untoward effect of the ergot on the circulation and of the bromid on the bowel and stomach.

During June 6 and 7, the respirations were very "choppy," and the heart action was very unsatisfactory. Cyanosis was present to a marked degree, and repeated

doses of strychnin sulfate, nitroglycerin, brandy, and atropin sulfate were given hypodermically. By noon of June 7 the involvement of the reflex centers in the medulla was very complete, and the child swallowed with great difficulty. By use of the ice-bags the temperature was kept below 102° until the evening of June 7, when it rose to 103°. A sponge bath with ice-water reduced it to 101.3°, when the child was badly cyanosed and the bath was discontinued, and nitroglycerin, strychnin sulfate, spartein sulfate, and brandy were given hypodermically, and a hot-water bottle placed over the heart. Atropin sulfate was administered in an attempt to improve the character of the respirations, which was very unsatisfactory. During the day morphin sulfate had been administered very sparingly in an attempt, at least partially, to allay the pain. At 9.15 the patient practically ceased to breathe, the heart action was very feeble and irregular, and the child was, to all intents and purposes, dead. Artificial respiration, after Sylvester, was maintained, but with practically no result, so it was abandoned, and oxygen forced into the lungs by passing the tube well into the throat, and compressing and dilating the chest wall manually. The child finally began to breathe, and although the respirations were very irregular and feeble, the oxygen was discontinued at 9.45 and a hot bath given. The condition improved in the bath, but as soon as the child was put in bed it had a rigor, and the respirations became very bad again. External heat was applied, oxygen administered, and brandy, .6 cc. (10 m.) given hypodermically. At 11 p.m. the temperature was 105.2°, and the character of the respirations had improved, so that it seemed safe to give a sponge bath, which was done, bringing the temperature to 102.4°, when the ice-bag was applied to the back of the neck, the temperature falling gradually during June 8, until at 6 p.m. it reached 99.4°. During June 8, ergot, in doses of from .06 cc. to .18 cc. (3 m. to 5 m.), triple bromid, .32 gm. (5 gr.), codein sulfate, 4 mg. ($\frac{1}{8}$ gr.) and hyoscin hydrobromid, .06 mg. to .1 mg. ($\frac{1}{1000}$ gr. to $\frac{1}{2000}$ gr.) were administered as indicated. On June 9 the treatment was the same, but the temperature was kept down with greater difficulty, and varied between 99° and 101.2°, the ice-bag being kept at the back of the neck almost continuously. The use of the triple bromid and ergot had to be discontinued on this day, and was resorted to only at one or two times afterward during the course of the disease. It was replaced with hyoscin and codein, and the heart action was maintained with brandy, digitalin, nitroglycerin, and strychnin nitrate.

On June 10, during the early hours of the morning, the temperature began to mount, reaching 102.1° at 3.40 a.m., when the ice-bag was applied, bringing the temperature to 99.1° at 4.40 a.m. The patient was now cyanosed, and this condition increased even after the removal of the ice. Respirations were more hurried and shallow, and at 5.30 the patient was given a hot bath, brandy administered and oxygen given. The respirations improved in character and the child went to sleep, sleeping quietly for nearly two hours. At 7.30 the temperature was 105.1° and a tepid bath was given, being changed to ice-water, when there was no appreciable lowering of the temperature after 20 minutes of the tepid sponge. Brandy was given at 7.50, and again at 8.50, the temperature being then 99.1°. At 10.30 the temperature was 101.1°, the child greatly cyanosed and cardiac action very poor. Oxygen was administered, together with strychnin nitrate, .1 mg. ($\frac{1}{1000}$ gr.), digitalin, .1 mg. ($\frac{1}{500}$ gr.), and brandy, .6 cc. (10 m.). From this time, 8.50 of the morning of June 10, to 6 a.m., June 12, the temperature ranged between 99° and 101°, going once in that period to 98°. The ice was kept on the neck and spine, when the temperature was above 99°. Codein sulfate, 4 mg. ($\frac{1}{8}$ gr.), with nitroglycerin, .1 mg. ($\frac{1}{1000}$ gr.), was administered every two hours. At 6 a.m., June 12, the temperature was 102°, and kept on

rising against the ice, until at 8.45 it was 103.2°, the child being badly cyanosed, and the respirations very shallow and irregular. A hot bath was given and oxygen administered. There was a good deal of distention of the abdomen, from gas in the intestine, and at 9.45, the temperature being then 104.2°, ice-water enemas were given, which relieved the distention, but failed to lower the temperature in any appreciable measure. Ice-bags were applied to the neck and spine, and the temperature gradually fell, reaching 100° at 5 p.m. By keeping ice-bags on the neck, the temperature was kept at 100° until 3.30 a.m. of June 13, when it went to 98°. The ice-bags were removed, and a hot-water bottle placed at the patient's feet, and by 7.30 a.m. the temperature had risen to 101.2°. During June 13, 14, 15, 16, the temperature ranged from 99° to 103°, being lowered when the ice was applied, and shooting up in a very short time whenever the ice was removed. The child was extremely irritable, crying out with the "brassy" cry that goes through one like physical pain, and makes these patients so hard to nurse. The nervous system was kept quiet with codein, which seemed to act better than any other narcotic. Strychnin, nitroglycerin, atropin, digitalin, brandy, and whisky were given, when required, and this was, indeed, an anxious period. At midnight of June 16, the temperature having risen from 100.3° to 103.4°, against the ice, the child was put into a hot bath. Respiration and heart action were very feeble, not responding to any stimulation, including oxygen. Temperature reached 104.4° after the bath, and, the ice being applied, went to 100° in two hours, and varied between 100° and 98° for the next three hours, being 99° at 6 p.m. At 7.30 p.m., the respirations and heart action having become weaker and weaker, although stimulation was kept up in every way, including the use of oxygen, the patient stopped breathing. By artificial respiration, and the use of oxygen (the tube being passed well back in the throat), the hypodermic injection of strychnin nitrate, nitroglycerin, and atropin sulfate, of each .1 mg. ($\frac{1}{100}$ gr.), and a hot bath, respiration was finally reestablished, and the administration of oxygen was kept up almost continuously until midnight, when respiration and heart action had improved, so that it was considered safe to stop it. During this time atropin sulfate, strychnin nitrate, nitroglycerin, and whisky were given hypodermically as required. Temperature was 103.4° at midnight, and ice was then applied to the neck and spine, and normal salt solution thrown high in the bowel. Oxygen was administered at intervals during the night, and the other stimulation kept up as indicated.

There was great tendency to irritation of a convulsive nature, any peripheral irritation causing convulsive movements of the limbs and rolling back of the eyes. Convergent strabismus and opisthotonos were quite marked. Respirations were irregular, but not of the Cheyne-Stokes type. Oxygen was administered as required. At 6 a.m. the temperature was 100°, patient very restless and cyanosed. Ice-bags were removed and the temperature immediately began to rise, being 101° at 9 a.m., and continuing to rise against the ice, reaching 104.1° at 11.30 a.m., and then falling to 99.2° at 2.30 p.m. About noon the little patient became very weak, and there were the clinical signs of internal hemorrhage, and, while the child rallied with stimulation, it vomited and passed by the bowel during the afternoon, and for some time afterward black material, which had the appearance of blood that had been acted on by the secretions of the stomach and bowel. I suspect that the sudden fall in temperature, the collapse, "black vomit," and black, tarry bowel movements, were due to a hemorrhage into the stomach. During the evening there was considerable distention of the abdomen, which was partially relieved by enemas, a very considerable quantity of black, tarry material being passed. The temperature ranged between 99.1° and 101° until 1 a.m.

of June 19, when it dropped to 96.2°, rising again to 99.2° at 5 a.m. Opisthotonos was more marked than it had been, and the child was very restless and cried out a good deal. The medicinal treatment was directed chiefly toward keeping the child quiet and maintaining the circulation and respiration, and consisted for the most part of codein sulfate, atropin sulfate, nitroglycerin, digitalin, and strychnin nitrate, in small doses. The doses of codein had to be increased, several doses of .02 gm. ($\frac{1}{2}$ gr.) being given to get control of the nervous manifestations. Nourishment consisted practically of whisky and water, this being about the only thing the child would take or could retain. During June 19 the temperature rose and fell in jumps of from 4° to 5°, as the ice was applied or removed, and on June 20 ranged, for the most of the day, from 99.1° to 100.3°, the only breaks being 98.2° at 7.20 p.m., jumping to 102.2° at 9.30, and dropping, under ice, to 97° at 11.30 p.m.

At 5.30 a.m. of June 21 the temperature was 101.2°, and ice was applied to the neck, the temperature falling to 99.3°, and then rising to 100°, around which point it remained all day, until the ice was removed at 8.30 p.m., when it rose to 101.8° at 9.40 p.m., and fell, under ice on the neck, to 100.2° at midnight, and to 98.3° at 1.40 a.m. of June 22. The ice was now removed, and the temperature remained between normal and 100° until 6.30 p.m. of June 22, when it reached 101.8°, falling, under ice, to normal at 8 p.m., and, the ice being removed, rising to 100.3° at 12.45 a.m. of June 23, where it was held with the ice until 7 a.m., when it began to rise. The respirations were very choppy, the patient very restless, and not responding to the codein; there was total suppression of urine. Heart action was very feeble. Oxygen was administered, whisky given hypodermically, and at 9.50 a.m., the temperature being 102.3°, a hot bath was given, the temperature reaching 103.4° at 10.30, and falling, under ice, to 98.4° at 11.30 a.m. of June 23, when the ice was removed, and a hot-water bottle placed at the patient's feet. The temperature continued to fall, reaching 97° at 2 p.m., then rising to 98.4° at 3 p.m., and reaching 101° at 5.45 p.m., and falling, under ice, to normal at 8.45 p.m.

The suppression of urine was treated by placing hot applications to the back and giving spirit of nitrous ether in all water taken by the patient.

At 5 a.m. of June 24 the temperature, which had risen a little, fell to normal without the ice and the child passed large quantities of urine and fecal matter and began to improve. The temperature ranged between 98° and 99°, going to 100° once only in the next few days, and then because it was given milk, which did not agree with it.

The convalescence was quite eventful, it having been necessary to keep up considerable stimulation and at times to administer oxygen in the small hours of the morning, the respirations having a tendency to become very irregular and the heart action to become weak during this period of depression. However, the child has continued to gain steadily and is on the road to complete recovery. The nourishment is thin oatmeal water, which the child takes very well, and which agrees with it much better than does the dairy milk.

I feel that too much credit for the successful termination of this case cannot be given to the nurse, who, by her unremitting efforts and self-sacrifice, made it possible to carry through to a successful issue a case that was as hopeless as any I have ever had in my care.

Veterinarians Dispute Koch's Tuberculosis Theory.—That bovine tuberculosis and human consumption are the same disease was asserted at the annual meeting of the Missouri Live Stock Breeders by two veterinarians and a member of the medical department of Missouri University.

THE EDIBILITY OF ANIMAL SPLEENS.

BY

EDWARD T. WILLIAMS, M.D.,

of Boston, Mass.

In the course of my investigations on animal spleens, the question naturally came to mind why these organs are never eaten. I knew as a fact that they are greedily devoured by butchers' dogs, and found myself asking whether the natural carnivorous instinct might not be a surer guide in the matter than human prejudice. So I tried a piece raw, and found it had much the taste of a scrap of raw beef. I then roasted a piece on a fork over hot coals, and ate it with a grain of salt. I found it capital. I then broiled a whole spleen on a gridiron like a steak and made a meal of it. It has about the consistency of liver when cooked, but is decidedly more agreeable in flavor. I found hog spleens richer and more palatable than beef spleens. I then tried them in the form of a stew or soup, or hashed up after broiling and served on toast. I found this the best dish of all when properly seasoned, and worked it on my friends under the name of a "Salmis Hæmatique." We found it a most hearty food, and always followed by a peculiarly bracing effect on the nerves, which I attribute to its richness in iron and phosphorus. Chemic analysis demonstrates that it contains $\frac{1}{2}$ gr. iron and $1\frac{1}{2}$ gr. phosphorus per ounce. These experiments fully satisfied me that the spleens of hogs and cattle were a rich and wholesome food, possessed of valuable hematinic properties, and ought to be generally eaten.

Why, then, had they never been used as food? The reason was furnished by my experiments.

Spleens, as they come from the animal, have a soft and pulpy consistency. They may be squeezed by hand into a bloody mush, as one might squeeze a handful of currants. This leaves the hand stained and bloody. I tried one on a dog, which was ravenously eaten, though it fouled and reddened his mouth in a way that was disagreeably suggestive. The application of heat, however, by the coagulation of their free albumin, gives them a consistency to be cut, chewed, and eaten like ordinary meat. By this means their natural repulsiveness is entirely done away with.

I find they must be eaten perfectly fresh. Their softness and the great number of blood-corpuscles in the pulp renders them peculiarly prone to decomposition. They must be eaten within six or eight hours after slaughtering at the furthest. I find it impossible to keep them over night even on ice. They are always found stale and sour in the morning and only fit for garbage. When cooked, however, they keep better.

Their softness and the necessity of eating them quite fresh shows why they cannot be handled and sold by the butchers like ordinary meat. They are in their natural state unmarketable. They can only be obtained at the slaughter-houses, which involves trouble and expense. To obviate this difficulty I have experimented largely with different methods of curing them while fresh and thus rendering them capable of permanent preservation. This subject I shall return to at a later date.

The number of spleens available for food purposes is almost without limit. A rough estimate based on the United States Census Reports reveals the fact that there are upward of 50,000,000 pounds of edible spleens thrown away yearly in the United States. This includes the spleens of cattle, hogs, and sheep. An ox spleen weighs upward of 2 pounds, a hog's spleen about 1 pound, a sheep's spleen 4 ounces, on the average. It is easy to see what an enormous amount of good food is thus wasted every year. The commercial value of these spleens reckoned at 10 cents per pound would be about \$5,000,000 per annum.

To be safely eaten they must, of course, be perfectly healthy. It is well known that the spleen is subject to various diseases. For instance, all infectious diseases are liable to affect the spleen. This is seen in tuberculosis, charbon, hog cholera, Texas fever, and other diseases of the same group. The animal parasite of Texas fever has a special tendency to affect the spleen and leave it permanently diseased, as in human ague, so that it would be wise to exclude the spleens of Southern cattle altogether. The government inspections already throw out all diseased carcasses, beside which, a personal inspection of every spleen handled by a competent expert would be strictly necessary. Tuberculosis, now growing painfully prevalent in all our domestic animals, is the one disease to be especially guarded against. Fortunately, the detection of a tuberculous spleen is easy.

This is a subject of vast import, medically as well as economically. The chemic composition of the animal spleen, coupled with its physiologic function as a blood maker, plainly indicates its value as a food for persons affected with impoverished blood. The inefficacy of mere medicinal agents in chronic diseases has always been recognized. "Diseases which are caused by depletion," says Hippocrates quaintly, "must be cured by repletion." Tonics and stimulants are well so far as they go, but to build up the system properly an ample supply of wholesome and nourishing food is a *sine qua non*. The spleen contains every element necessary to make healthy blood, albumin, iron, phosphorus, and mineral salts, all in natural organic combination and in the most digestible form. To my mind, the whole problem of iron and phosphorus medication is destined to find its solution in the general adoption of animal spleens as a blood-making food.

"I find myself," said Emerson, "harping on a few strings." Perhaps I am harping too much on the dietetic value of animal spleens; yet something tells me I ought not to stop till I have succeeded in convincing people of their usefulness.

Insanity Statistics.—The Massachusetts State Board of Insanity, in its seventh annual report, says that the whole number of the insane, the feeble-minded, the epileptic, and inebriates under care October 1, 1905, was 11,990; 5,966 men, 6,024 women, an increase for the year of 416—211 men and 205 women. The insane on the same date numbered 10,153; 4,832 men, 5,321 women, being one insane person to every 296 persons of the general population. It asks that accommodations be provided for 200 more. The extreme overcrowding reported last year has been relieved and will continue so if the State will furnish this additional room each year.

DIGEST OF MEDICAL LITERATURE

GENERAL SURGERY.

J. CHALMERS D'ACOSTA
JOHN H. JOPSON LAWRENCE HENDEE
J. COLES BRICK JOHN W. CHURCHMAN

A REVIEW OF THE LITERATURE OF SCOPOLAMIN-MORPHIN ANESTHESIA.

BY
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In reviewing the literature of this subject one is struck by the varied reports and attitudes of different writers both for and against this method. Some writers have praised its use, others of equal ability have condemned it as uncertain and unsafe. All have agreed that its action is varied in different individuals, some writers attributing this to the drug itself, others to the personal idiosyncrasy of the patient.

The dosage of the combination has also been varied. Some have used large single doses, others a large quantity distributed over from one to three hours before operation. Still others have used a small quantity in a single dose from a half to an hour before operation. Those using the large quantity have attempted to get complete narcosis from its use alone, succeeding in some cases, failing in others. The use of a small quantity has been apparently directed to the lessening of the quantity of ether or chloroform to be used at the time of the operation, as well as preventing the uncomfortable and distressing after-results of anesthesia. This method has met with a greater success apparently than the other.

Deaths have occurred with its use in combination with ether or chloroform and when used alone. Some have claimed that these deaths, when it was used in combination or mixed anesthesia, were due to the fatty degeneration of the parenchyma of the various organs, caused by the chloroform or ether. Others hold that such fatty degeneration has never been seen when such small quantities of ether or chloroform were used (Israel's case), and that therefore the fatty degeneration was probably due to the inhibitory effect of the scopolamin and morphin in the elimination of the ether or chloroform. One death (see report of Flatau's case) occurring when scopolamin and morphin alone was used was ascribed by the writer reporting the case to be clearly due to the two drugs. Another writer (A. C. Wood) commenting on this case states that all the symptoms pointed clearly to the pulmonary embolism which must have occurred as the cause of death.

Observations made in 1900 as regards mixed anesthesia may be of interest in relation to scopolamin-morphin anesthesia. Bernhard (American Yearbook of Surgery, Gould, 1901, under Cosmio Noto's article) is quoted as having demonstrated that by giving morphin before chloroform anesthesia a prolonged operation could be done with much less chloroform. The author stated that it also prevents or shortens the period of excitement and abolishes the dangerous laryngeal reflex. Its objections were as follows: Morphin produces stupor, increases shock, adds to the lowering of temperature,

and increases the toxicity of chloroform. (Crile, in a more recent work, states that the shock is decreased by its use.) To overcome the ill-effects of the morphin, Spencer Wells proposed the addition of alcohol to the chloroform—with no results. Forné substituted chloral for morphin, but increased the danger. Trelat and Perrier used both chloral and morphin together, but with the same objectionable results. Dastre and Morat proposed atropin and morphin with the chloroform; also, Reinhardt (Zentralblatt für Chirurgie, 1901, No. 11). Braun (Zentralblatt für Chirurgie, 1901, No. 17) immediately followed Reinhardt's article, pointing out the dangers of such a method, while clinical results are certainly doubtful. Langlois and Maurange substituted spartein for atropin. Cosmio Noto, the author of the article, substituted helleborin for morphin, and found that the lowering of blood-pressure was lessened, but that the period of excitement was not modified at all. He then tried paraldehyd, stating the following results: Period of excitement was suppressed, vomiting and salivation prevented, anesthesia rapidly produced and easily prolonged with a small quantity of chloroform, some advantage to the cardiovascular system.

In reviewing the literature, the use of scopolamin and morphin appears to have been directed at two different objects in view. First, to obtain complete narcosis by its use alone, or in case of failure to obtain such, the rendering necessary of but a slight amount of ether or chloroform to complete the anesthesia. Second, merely to decrease the amount of ether or chloroform and to prevent the distressing and uncomfortable operative and postoperative symptoms. The first object required a considerable amount of the drug. Schneiderlein (Aerzt Mitteil aus u. für Baden, May, 1900), who introduced the use of morphin and scopolamin in combination, gave scopolamin 0.0008 gm. (about $\frac{1}{8}$ gr.) and morphin 0.02 gm. to 0.03 gm. ($\frac{1}{2}$ gr. to $\frac{3}{4}$ gr.) one hour before operation. If fifteen minutes before operation the narcosis was not deep enough, an additional dose of scopolamin 0.0002 gm. to 0.0004 gm. ($\frac{1}{2500}$ gr. to $\frac{1}{1250}$ gr.) and morphin 0.005 gm. to 0.01 gm. ($\frac{1}{40}$ gr. to $\frac{1}{20}$ gr.) was given. Korpf (Münchener med. Woch., July, 1901) took up Schneiderlein's method and reported his results. Finding that although the second object in the use of the drug, *i. e.*, reducing the amount of chloroform or ether necessary was always obtained, yet the obtaining of full narcosis did not occur in a sufficient number of cases. Considering also that the giving of large single doses to be dangerous in many instances, he modified this method, publishing his new formula (Münchener med. Woch., Nov., 1903). This second formula was:

Scopolamin hydrobrom.	0.001 gm. ($\frac{1}{1000}$ gr.)
Morphin hydrochlor.	0.025 gm. ($\frac{1}{40}$ gr.)
Aqua destil.	10.00 gm. (8 fldr.)

Divided into three equal doses and given first dose 2½ hours before operation; second dose 1½ hours before operation, and the third dose one-half hour before operation.

He stated that by this method the average dosage with the highest efficiency was obtained, and that the dangers of single dosage to the old, young, and weak patients were obviated.

Blos (Beiträge f. klinische Chirurgie, v. Bruns, Bd. 35, H. 3) held that increasing the amount of morphin

gave better results than a small dose of morphin with a comparatively large amount of scopolamin. Stolz (Weiner klin. Woch., 1903, No. 11), in reporting five of his cases in which he used Korff's method, states that in all five cases he failed to get full narcosis—it being necessary to use chloroform or ether and that some of them were very restless. He also reported another case wherein he used morphin, 0.01 gm. ($\frac{1}{4}$ gr.), alone in three doses, and timed the same by Korff's method. This case was the quietest of them all and only a very small amount of chloroform in addition was necessary. Kochmann (Münchener med. Woch., 1905, No. 17) reports giving scopolamin in proportionately enormous doses to dogs with no deaths. He gave scopolamin alone, 0.0005 gm. (about $\frac{1}{125}$ gr.), to a dog 6 to 7 kilograms in weight. He also gave morphin alone, dose 0.01 gm. ($\frac{1}{4}$ gr.), to a dog of the same weight, with no bad results. Because of the question of giving large doses to patients with heart or kidney affections, he took two dogs of about the same weight—one healthy as a control and one with acute lead-poisoning that showed a slight trace of albumin. The dog with lead-poisoning died from respiratory failure with a dosage of 0.01 gm. ($\frac{1}{4}$ gr.) "of the alkaloids," while the control dog withstood a dosage of 0.015 gm. ($\frac{1}{4}$ gr.) "of the alkaloids" without any bad results. From this he concluded that in patients that were moribund before operation, or had cardiac or kidney affections, such as Witzel's, Israel's, or Bloss' cases, large doses might cause death.

The total number of cases so far reported of this form of anesthesia is about 2,700. The exact deathrate, both with or without chloroform or ether in addition, appears as yet undecided. Landau (Deutsche med. Woch., 1905, No. 28) gives as a conservative estimate, including only those cases which one can reasonably assign to the method and not to the severity of the operation or condition of the patient, as 2,300. This high rate he compares with the deathrate of chloroform 1 in 2,075 and ether 1 in 5,112 (Deutsche Gesellschaft für Chirurgie, 1897).

Kochmann, in reviewing 1,200 cases, gives it as 1 to 100. However, he further states that fully half of these cases were past operative aid and that other forms of narcosis were also interdicted.

At this point it may be of interest to review the reports of some of the cases in which death or accidents have occurred:

Witzel (Münchener med. Woch., 1902, No. 48).—He gave to an old prostatic patient with severe genito-urinary infection, in total, scopolamin 0.0036 gm. (about $\frac{1}{8}$ gr.) and morphin 0.03 gm. ($\frac{1}{4}$ gr.), spread out in doses extending over four hours before operation. Death caused by heart failure.

Bloss (see earlier reference).—Case, male, aged 50; marked pulmonary emphysema and tuberculosis, myocardial degeneration, slightly cyanosed, caries of pelvis and os sacralis, albuminuria. At operation a large amount of blood was lost. Trial dose, scopolamin 0.001 gm. ($\frac{1}{80}$ gr.) and morphin 0.03 gm. ($\frac{1}{4}$ gr.); well borne. The day of operation, scopolamin 0.001 gm. ($\frac{1}{80}$ gr.) and morphin 0.06 gm. (1 gr.). Three-quarters of an hour later another dose of scopolamin 0.0005 gm. ($\frac{1}{160}$ gr.) and morphin 0.05 gm. ($\frac{1}{4}$ gr.). Slept after a half hour. Pupils dilated, pulse 90, respiration 10. After operation patient appeared to be in good condition. Soon cyanosis appeared, became marked six hours later; death due to

respiratory failure. Autopsy showed pulmonary tuberculosis, amyloid degeneration of kidney and intestines. Because of this Bloss considered that death was more immediately due to the delay in elimination of the morphin and scopolamin. However, in this case attention should be drawn to the large doses of morphin given in such close succession.

Wild (Berliner klin. Woch., 1903, No. 9).—Boy, aged 18, empyema of antrum. At 8.15 a.m. scopolamin 0.001 gm. ($\frac{1}{80}$ gr.) and morphin 0.06 gm. (1 gr.) was given. At 9.45 scopolamin 0.0005 gm. ($\frac{1}{160}$ gr.) and morphin 0.03 gm. ($\frac{1}{4}$ gr.) was again given. Pulse 116, respiration 12, pupils dilated but reacted. Operation 10.20 a.m. Patient still awake; 45.00 cc. of ether given by drop method to complete the narcosis. The operation lasted 30 minutes. After operation patient slept, although he was able to be aroused. Respiration irregular, 10 per minute; face somewhat cyanosed. Two hours later respiration was of the Cheyne-Stokes type. While he breathed the pulse was full and strong; during the intervals, small and slow. Pupils were slightly more contracted than normal and reacted. Unable to rouse patient. Three hours later patient's condition was worse. Color, bluish gray; respiration marked by rales; radial pulse lost; pupils widely dilated; glassy cornea; pupillary reflex absent. Strong stimulation was administered, i. e., camphor, faradic current, normal salt solution infusion. One hour later marked improvement in the condition of the patient. Short time later patient awoke as though out of a deep sleep. No lung infection nor bloody expectoration; therefore there could not have been any blood inspired during the operation.

Again one's attention may be drawn to the large total dosage of morphin, i. e., 0.09 gm. (1 $\frac{1}{4}$ gr.) and to the close resemblance of the symptoms of morphin poisoning.

Dirk (Deutsche medicinische Wochenschrift, 1905, No. 10) reports three deaths among his cases. He followed Korff's later method, practically, in the use of the drugs. His patients were 69, 73, and 76 years of age. One with carcinoma of intestines died on the table. The remaining two had diffuse septic peritonitis. No blame in these cases can be attached to the form of narcosis.

Israel (discussion of Dirk's paper) first reported one case which had anuria for eight days; was given scopolamin 0.0008 gm. ($\frac{1}{80}$ gr.) and morphin 0.02 gm. ($\frac{1}{4}$ gr.) three-quarters of an hour before operation. At operation 40 cc. of ether was given. Patient died practically at the beginning of the operation. In this connection he mentioned two other cases. One a rather weak patient with a single-side kidney tuberculosis, with good function of the other kidney and with other organs also sound. The other case, an 18-year-old girl, exceptionally strongly built, who had a septic peritonitis following a pyosalpinx. Both got the same dose of scopolamin and morphin, i. e., scopolamin 0.0008 gm. ($\frac{1}{80}$ gr.) and morphin 0.02 gm. ($\frac{1}{4}$ gr.). The kidney case received 18.00 cc. and the other 25.00 cc. of chloroform in addition. In both cases the kidney secretions were very markedly decreased. Both showed on the first day a very high pulse frequency. By the third day both were restless, and on the fourth day, coma and death. The autopsy in both cases showed very marked fatty degeneration of heart muscle and liver. The kidney case showed no old lesion of the other kidney or other organs; the sound kidney showing, however, an acute congestion and swelling. The fatty degeneration of the liver, kidney, and heart muscle of the second case was so marked as to raise the question of the possibility of phosphorus poisoning. The specimens were examined by Geh. Prof. Orth. By his examination phosphorus poisoning as a cause was excluded. As sepsis, as a cause, could be excluded, and further that the small quantity of chloroform could not alone have caused it, Israel raised the question of whether the scopolamin and morphin

might not, working together, have greatly hindered the elimination of the chloroform, thus bringing about the condition.

Bakes (Beiträge zur Bauchen Chirurgie, Langenbeck's Archives, Bd. 74, H. 4) reports the loss of three cases. First case: Child, 8 years old, with osteomyelitis, total sequestration of femur. Dosage: scopolamin 0.0005 gm. ($\frac{1}{100}$ gr.) and morphin 0.015 gm. ($\frac{1}{4}$ gr.) one hour before operation. During the operation a great deal of blood was lost. Normal salt solution infusion given; death. Autopsy showed amyloid degeneration of the heart muscle and the parenchyma of the other organs.

Second case: One hour before operation scopolamin 0.001 gm. ($\frac{1}{100}$ gr.) and morphin 0.0275 gm. (about $\frac{1}{4}$ gr.) were given. Operation for carcinoma of uterus, total extirpation, Wertheim's method; 308 cc. of ether used during operation. Iliac vein was excised in removal of infected lymph-node. Patient collapsed and died one hour after operation.

Third case: Woman, aged 60 years, large sarcoma of the neck. One hour before operation scopolamin 0.0008 gm. ($\frac{1}{100}$ gr.) and morphin 0.02 gm. ($\frac{1}{4}$ gr.) were given; 60 cc. ether was used during the operation. Operation was not marked by hemorrhage, or other uncomfortable complications. The internal jugular vein and external carotid artery were ligated and resected. At the close of the operation the patient's condition was excellent. Shortly after her return to bed she collapsed and died. After-inspection of wound showed that no hemorrhage had occurred and that the vagus nerve was uninjured.

Flatau (Münchener med. Wochens., 1903, Vol. xxviii).—Peasant woman, aged 52; lesion, submucous myoma of the uterus about the size of an egg and projecting into the uterine cavity. Hemorrhage had occurred, but not of an unusual amount. Physical examination showed heart and lungs normal, urine free from albumin, pulse 108. The trial dose was well borne, the patient sleeping deep and quiet. The next day scopolamin 0.0036 gm. (about $\frac{1}{100}$ gr.) and morphin 0.08 gm. ($\frac{1}{4}$ gr.), divided into three doses, was given. No further anesthetic was necessary. The myoma was quickly removed, the uterus washed out and packed with iodoform gauze. Little blood was lost. Condition of patient during operation was excellent. Four and a half hours later collapse, pointing more particularly at heart failure. Edema of lungs, Cheyne-Stokes respiration, various forms of stimulation were tried without success, and one and a half hours later patient died. Flatau holds that this death was entirely due to the drugs. (See earlier reference to A. C. Wood's conclusions on the same case.)

Landau (see former reference).—In 17 cases he had one death. Case: Male of somewhat advanced age; lesion; four internal hemorrhoids, hazelnut in size. Heart, lungs, and kidneys were apparently normal; very slight arteriosclerosis.

Two hours before operation scopolamin 0.009 gm. ($\frac{1}{100}$ gr. to $\frac{1}{80}$ gr.) and morphin 0.02 gm. ($\frac{1}{4}$ gr.) were given; deep sleep. At the time of operation cocaine hydrochlorate solution, in total 0.08 gm. ($\frac{1}{4}$ gr.) of cocaine, was injected into the bases of the hemorrhoids. At the time of operation very little blood was lost. The hemorrhoids were excised and their bases sutured. The veins were not thrombosed.

Patient awoke one hour after the operation. He was restless and cried out a great deal from pain. During the operation the pulse was good, cyanosis was not more marked than in the other cases. Two and one-half hours after the operation patient collapsed, reacted slightly to stimulation. One-half hour later collapsed again, symptoms pointing particularly to the heart. Died. Autopsy not made.

Wood, A. C. (*American Medicine*, November 11, 1905), in his series of 15 cases reports one death. This case is interesting as being the oldest patient reported in which morphin and scopolamin were used. Case: Colored man,

aged 94; operation, suprapubic prostatectomy for an enlarged prostate which was principally due to two abscesses—prostate. Wood gave scopolamin 0.001 gm. ($\frac{1}{100}$ gr.) and morphin 0.016 gm. (about $\frac{1}{4}$ gr.) at 11 a.m. and at 1 p.m. Operation at 2 p.m. Death occurred on the following day. Again, of course, the anesthetic material cannot be held responsible for the death.

The efficiency of large doses for obtaining complete narcosis is not very high. Dirk, using Korff's method, out of his 260 cases had only 29 cases in which further anesthetic was not necessary. Israel, using the single dose of scopolamin 0.0008 gm. ($\frac{1}{100}$ gr.) and morphin 0.02 gm. ($\frac{1}{4}$ gr.) in his 332 cases had but 32 cases in which full narcosis was obtained. The remaining 300 cases required from 10 cc. to 15 cc. of chloroform and the maximum, 25 cc.

Wood quotes the following statistics: Ziffer, 21.8% full narcosis. Zahradnicky, out of 232 cases, had 100 cases in which further anesthetic was not necessary. In Stolz's 465 cases, 156 obtained full narcosis. Wood himself reports the following: In 15 cases, 8 cases full narcosis, 4 cases partial, requiring ether or chloroform, and 3 cases complete failure of any good effects.

Flatau, out of 30 cases tabulated in his record table, had better results. He used Korff's method. In 7 cases anesthetic was necessary because of the restlessness and lack of depth of the narcosis. In 2 more cases (9 in all) a little chloroform was given because of the length of the operation. His thirtieth case in this series is the one that died.

In regard to the results obtained in the use of the drug in a small single dose, to reduce the amount of chloroform or ether necessary and to prevent the post-operative occurrences, the following reports have been made:

Seelig (*Annals of Surgery*, Aug., 1905) reported 65 cases in which he gave scopolamin 0.0005 gm. ($\frac{1}{100}$ gr.) and morphin 0.01 gm. ($\frac{1}{4}$ gr.) one-half to one hour before operation. The general anesthetic was very smooth. One patient only retched and vomited on the operating table. Seventy percent of the patients did not vomit at all. One-third of the cases vomited only once. Nausea was pronounced in 2 cases. Vomiting, with one exception, never occurred earlier than two hours before operation.

Hartog (Münchener med. Wochens., 1903, No. 46) reports 93 cases. In 20 various doses were tried. In 73 cases he gave scopolamin 0.0005 gm. ($\frac{1}{100}$ gr.) and morphin 0.01 gm. ($\frac{1}{4}$ gr.) one-half to three-quarters of an hour before operation. Ether was used as a general anesthetic. He made the following observations: First, quietness of the anesthetic; second, absence of vomiting during the narcosis even when it was not deep; third, after operation patients were quiet, and awakened without excitement; headache and general discomfort usually absent; fourth, postoperative vomiting was usually absent; at most not more than a little retching occurred; fifth, marked salivation did not occur in a single case.

By the courtesy of Dr. Roswell Park I am able to mention in a general way the results noticed in the use of the drug during the past fall and winter in his clinic in approximately 350 cases. He gave scopolamin 0.0005 gm. to 0.0008 gm. ($\frac{1}{100}$ gr. to $\frac{1}{80}$ gr.) and morphin 0.01 gm. ($\frac{1}{4}$ gr.) one-half to one hour before operation. The anesthetic was marked by its quietness, absence of vomiting or retching during operation, marked decrease in the chloroform or ether necessary. The proportion of

cases exhibiting postoperative vomiting was about the same as when the drugs were not used. Two of the patients, both of marked cholemic infection, died 24 hours after operation. Both had anuria. Dr. Park considered, from his experience, that the scopolamin and morphin inhibited elimination to a considerable degree. Furthermore not observing any greater benefit from the scopolamin than observed from atropin he has recently abandoned its use, relying upon morphin alone, as formerly.

Much comment has been made upon the uncertainty of the action of scopolamin. The drug itself has often been held responsible for that. It has been claimed that it frequently varies in its strength and composition. In this connection the observation of Israel in his own cases may be of interest, *i. e.*: "If one, for example, used as he had the same preparation of the drug and the same solution on 3 or 4 patients on the same day, and on 2 the preparation acts well and in the third fails, then one can assign this to the personal variation of the patient and not to the drug." Such was his experience.

The reports of the physiologic action of the drugs still leave many questions unanswered.

H. C. Wood (*Materia Medica*, tenth edition) states that the action of hyoscin or scopolamin is as follows:

First, most marked upon the cerebral cortex, causing sleep with a low muttering delirium; second, central depressant of respiration and also somewhat feebly a depressant of the whole motor cord; third, very slight influence upon circulation.

Stolz gives it as follows: First, it has a depressant action on the function of the brain, particularly of the cortex; second, increases pulse frequency; third, lessens glandular secretions; fourth, its total action is somewhat opposite to that of morphin.

Kochmann (*Therap. der Gegenwart*, May, 1903) states: First, small doses stimulate the vasomotor centers and increase blood-pressure. Large doses decrease blood-pressure considerably, depressing the excitomotor centers of the heart; second, the pulse remains unchanged frequently by small doses. Because of irritation of the vagus in large doses, the pulse becomes less frequent; third, excitability of the cerebral cortex by the faradic current is decreased; fourth, respiration is not affected by small doses, but is markedly depressed by large doses; fifth, secretion of saliva, mucus, and perspiration stopped; sixth, locally applied and after absorption mydriatic, paralyzing accommodation; seventh, it is excreted through the kidneys.

It can be seen that many interesting physiologic questions remain to be answered. Two important ones are: The rapidity of its elimination, both alone and in combination with morphin, and whether the combination of the two inhibits or not the rapid elimination of the chloroform or ether that may be used.

The term scopolamin throughout this review refers to the preparation scopolaminum hydrobromicum. In the German pharmacopeia only the term scopolaminum hydrobromicum is retained, while in the British pharmacopeia it is used as a synonym for hyoscin hydrobromicum. In the last pharmacopeia (U. S.) it is official as scopolaminæ hydrobromicum, and is defined as a hydrobromid of an alkaloid obtained from plants of the solanaceæ, a chemical identical with hyoscin hydrobromid.

Scopolamin was discovered by Schmidt, of Warburg, in 1890, in a plant called scopolia, which was named after Scopol, an Austrian naturalist.

Some confusion has arisen in the past due to the different authorities. Some considered that scopolamin was merely an impure hyoscin, while others thought that hyoscin was a mixture of scopolamin with other substances.

The effect of the two is very much alike. Ries states in his earlier cases that he used hyoscin in place of scopolamin, because he was unable to obtain the latter drug, his results being equally as good with the hyoscin.

It is generally considered that one of the causes of the irregularity in action of the drug is referable to the impure preparations. Solutions of the drug in water are quite unstable, and at the longest do not keep a week. The drug rapidly decreases in its effect toward the end of that time. The majority of the writers state that they have fresh solutions made every three days. A manufacturing firm has of late made up a tablet triturate ($\frac{1}{100}$ gr.) of Merck's preparation, which can be used the same as an ordinary hypodermic tablet. What the length of life of this form of the drug is remains yet to be determined.

PATHOLOGY.

ALLER G. ELLIS

CIRRHOSIS OF THE LIVER AND ASSOCIATED CONDITIONS.

A CRITICAL REVIEW OF RECENT INVESTIGATIONS.

BY

ALLER G. ELLIS.

The principal additions to the literature on cirrhosis of the liver during the past year are those dealing with the histologic nature of the process. As on this point must largely be based our general conception of the affection, including its treatment, the subject is of paramount importance. The aspect of the question to which we refer is the part played in cirrhosis by degenerative, and particularly, regenerative changes in the liver parenchyma. So far as the former or degenerative changes in the cells are concerned, it may be said in passing that this idea is not recent nor is it confined to the liver alone. There has been for some years an increasing tendency to regard the so-called chronic interstitial inflammations of the various organs as primarily a degenerative and atrophic change in the parenchymatous cells, with a consequent substitute fibrosis, rather than as an antecedent initial increase in the supporting connective tissue of the affected viscus. Of regenerative changes in the parenchyma, however, little has been said regarding any organ but the liver, and of that only in quite recent years.

Kretz (*Wiener klin. Woch.*, 1900, Vol. xiii, p. 271) first particularly emphasized the importance of degenerative changes in cirrhosis of the liver and has since upheld the theory, one of his latest papers appearing in *International Clinics*, 1905, Vol. iii, Fifteenth Series, p. 289. His findings have to a greater or less degree been confirmed by MacCallum (*Journ. Amer. Med. Assoc.*, 1904, Vol. xliii, p. 649), Böstrom (*Deut. med. Woch.*, 1905, xxxi, p. 167), and Kelly (*Amer. Jour. of the Med. Sciences*, 1905, Vol. cxxx, p. 951). An unpublished

paper by Pearce (abstract in *American Medicine*, 1905, Vol. ix, p. 1027) on "Experimental Cirrhosis of the Liver" also emphasizes the importance of primary degenerative changes in the liver cells and thus lends support to that part of the theory now under discussion. The work of Pearce was suggested by the experimental production of liver necroses by the injection of hemagglutinins (*Jour. of Med. Research*, 1904, Vol. xii, p. 329), and that of the other writers mentioned really grow out of the study of regenerative changes found in nonfatal cases of the so-called acute yellow atrophy of the liver.

In his writings, Kretz also calls attention to the structure of the normal liver, giving to the organ a histology which, though described a long time since by Hyrtl, has not been commonly accepted and taught. Adherence to this view materially aids in comprehending the regenerative changes described by him as occurring in the liver. According to this interpretation, the liver is not made up of isolated lobules or acini, containing a central vein and enclosed by connective tissue, but the parenchyma is continuous as mantles of cells surrounding the dendritic branches of the hepatic veins; these mantles are universally connected, but especially so at the junction of the central, lobular, and lobar veins. Kelly accepts this view, and states that such structure may be readily demonstrated by study of serial sections and consequent reconstruction of the liver. He regards Sabourin's views as differing practically only in substituting the portal for the hepatic vein, and thus making no essential difference in the present study of cirrhosis, as in either case the hepatic cells form continuous mantles around the vessels.

In comparing the histologic pictures of normal and of cirrhotic livers, Kretz finds in the latter two conditions other than proliferation of connective tissue worthy of special mention. First, the cirrhotic liver contains portions of parenchyma equaling in size a pea or bean, which contain distinct hepatic veins; generally there are several of them, but irregularly distributed, so that four or five central veins may take up the blood from a single nodule. These, in type, represent the old multilobular cirrhosis, but are easily recognized as liver tissue that has been rearranged as the result of regeneration. Again, hepatic veins are found in small islets of liver tissue eccentrically placed. As the surrounding parenchyma is not compressed, these vessels can occupy such positions only by virtue of an asymmetric degeneration and regeneration of the parenchyma. Kretz describes the circulation in the diseased liver as follows: "A small part of the portal blood passes through the remnants of the old acinous channels into the hepatic veins; this passage forms an internal portocaval anastomosis supplementing the external; to the remaining branches of the portal vein more than the normal amount of arterial blood is furnished; this, on the one hand, supplies the granular areas of the parenchyma devoid of hepatic veins, and on the other the hypertrophic remains of acinous tissue. This excess of blood passes under increased pressure through the remainder of the old capillaries, narrowed by atrophy of the acini, and lengthened by hypertrophy of the liver tissue. The lengthening and narrowing of the capillary vessels and

the excess of arterial blood are the true causes of the increase of portal pressure, as is shown by the occurrence of ascites in subacute atrophy of the liver with regeneration, but without contracting connective tissue." In the coarsely granular cirrhoses the connective tissue contains little elastica; in the finely granular types small collections of hepatic cells are surrounded by connective tissue rich in elastic fibers. Kretz concludes, as a result of studying these changes in the cirrhotic liver, that it is impossible to consider the process as a chronic inflammation originating in the interstitial tissue; the histologic picture points rather to a complete transformation of the whole parenchyma. "With the recognition of cirrhosis as a focal recrudescence, chronic atrophy, modified by the invasion of parenchymatous regeneration, every reason for regarding cirrhosis as a disease entity disappears."

MacCallum presents the results of a study of 60 cases of cirrhosis of the liver studied in the Johns Hopkins Hospital, placing particular stress upon regenerative changes in the parenchyma. He discusses at length the role played in cirrhosis by the bile ducts and the bile duct-like structures in the new connective tissue, especially the disputed point as to whether they are liver cells undergoing retrogressive changes, that is, remnants of the old lobule, or are newly-formed strands of cells arising from liver cells or the epithelium of the bile ducts. He cites a case in which mitotic liver cells with typical formation of bile duct-like strands in the connective tissue shows the process to be by no means degenerative in character but due to the active production of new cells. Mitosis was also observed in the cylindric cells lining the bile ducts. MacCallum considers it of little moment whether the regenerated cells are formed from liver cells or bile-duct epithelium as the two are identical so far as regeneration is concerned. He defines cirrhosis as "a chronic disease in which destructive processes, probably often repeated, result in a loss of functional liver tissue immediately followed by the formation of a scar, the healing process, and later by an attempt at the restitution of the liver to normal by regenerative processes."

Kelly's paper is based on a study of 30 cases of cirrhosis and many other cases of disease of the liver at the German Hospital and of cases of cirrhosis from several other sources. He considers (1) the structure of the liver; (2) changes in the parenchyma of the liver in cirrhosis; (3) changes in the connective tissue in cirrhosis; and (4) the nature of cirrhosis as drawn from the foregoing. His work is in some respects only confirmatory of that presented by Kretz and MacCallum. He directs attention to the changes in the arrangement of the liver cells in the lobule, the normal radial appearance being partially or entirely lost and the cells placed irregularly, in parallel rows, and in other ways. He also cites the presence of liver cells that are nonatrophied or even plumper than normal at the periphery of the lobule in contact with the new fibrous tissue, a site in which the cells should be atrophied or at least compressed if the old view of cirrhosis with primary increase and contraction of the perilobular tissue and secondary atrophy of liver cells were correct. Special reference is made

to the evidences of hyperplasia of liver cells in every cirrhotic liver, even in far advanced cases; like MacCallum, he emphasizes the histogenetic equivalence of liver cells and bile-duct epithelium. Regarding the nature of fibrosis in cirrhosis, Kelly considers it a phenomenon secondary to degenerative and regenerative changes in the liver cells instead of a primary interstitial change. He admits, however, that the cause of the necrosis in the liver cells may also set up inflammatory phenomena in the interstitial tissue, making thus in some cases the process both a replacement and an inflammatory fibrosis. He considers it proper to discountenance the use of the terms atrophic and hypertrophic, since a large liver may be conspicuously atrophic and hypertrophy of the liver cells is a feature of all small livers.

Pearce caused necrosis of liver tissue by injecting dogs with serum obtained from rabbits which had been given repeated injections of red-blood corpuscles of the dog. The first evidence of repair in these necrotic areas was mitosis of the adjoining liver cells, this in one instance appearing 38 hours after injection of the serum. Later, proliferation of endothelial and connective-tissue cells was evident, and by the fifth day the necrotic tissue was largely replaced by formative tissue in which divided liver cells were found in considerable numbers. Still later, newly-formed bile ducts appeared in the stroma, and the development of liver cells from these ducts is readily demonstrated. The oldest lesion studied was very similar to early cirrhosis in man. Pearce regards the results of the experiments as demonstrative that cirrhosis may follow extensive primary destructive lesions, and to this extent are a support to the contention of Kretz.

A further contribution to this subject is contained in a communication of Herter and Williams to the Society for Experimental Biology and Medicine (*American Medicine*, 1905, Vol. x, p. 914). These observers produced experimental hepatic cirrhosis in dogs by repeated inhalations of chloroform, narcotization lasting from one to one and one-half hours and being repeated from 18 to 49 times. Similar changes were induced in the livers of all the three dogs employed and consisted of an abundant, richly cellular connective-tissue growth between and into the lobules. The bile ducts were proliferated and the liver cells showed hyaline and fatty degeneration. In two of the dogs a portion of the liver was first removed to serve as a control. Analysis of the cirrhotic liver showed a distinct fall in the arginin of the proteid molecule. Further study showed that the arginin content may fall rapidly after even short exposures to toxic influences. These findings lend weight to the view that the connective-tissue increase in cirrhosis of the liver is secondary to changes in the chemic constitution of the liver cell. It also suggests the possibility of hepatic cirrhosis in man following the parenchymatous changes induced by a single chloroform narcosis.

The practical bearing of this conception of cirrhosis, as summarized by Kretz, is that real advance in our knowledge of this condition is to be obtained by further search for the causes of degeneration, particularly focal destruction, of hepatic cells; attempts to separate and classify the forms of fully-developed disease of the liver

add nothing that is really new. Investigations which should have the greatest value are, therefore, those dealing with experimental and clinical chemistry. He also regards this view as teaching the clinician that cirrhosis in its early stages, and at the onset of grave portal stasis as well, is still capable of being improved. Rational treatment can be based only on the early recognition of the agents injuring the hepatic cells.

The changes in the liver parenchyma are in these papers, as a matter of course, made particularly prominent as embodying a new view, or rather an old view well elaborated. Collectively, the articles are a valuable contribution to a subject about which the last word has not yet been said, and form a strong argument for cirrhosis of the liver, being in nature essentially a substitutive fibrosis consequent to cell destruction. So far as the clinical side of cirrhosis of the liver is concerned, however, it appears possible that undue stress has been put upon regenerative changes in the hepatic cells. While this process, if rightly interpreted, is to be looked upon as an attempt to replace lost tissue, and in some cases may be so far successful as to delay or even prevent the otherwise inevitable result, the fact remains that in the great majority of cirrhotic livers the fibrosis is the dominant feature and leads to the symptoms of the affection in spite of the regeneration of liver and bile-duct cells. On the other hand, if this conception be correct, it may be regarded as accounting for the cases of cirrhosis, in some instances advanced, which give rise to no symptoms and are discovered only at autopsy; just why regeneration should efficiently maintain function in these cases, in spite of the fibrosis, is not clear.

Concerning the etiology of cirrhosis or the early diagnosis of the condition, but little has recently been added. The general view of its cause is well expressed by Saundby (*The Practitioner*, June, 1905) who says that although in the postmortem room cirrhotic livers from many sources of origin are found and though it may be admitted that interstitial hepatitis may arise from toxins, or from other substances than alcohol taken as a food, the chief and nearly invariable cause of the affection as we recognize it clinically, is the excessive use of alcoholic drinks. The first symptoms of which the subject of his report complained, nine months before death, were pain and distention of the abdomen.

Of interest in this connection is the case of obliterating endophlebitis of the hepatic veins reported by Hess (*Amer. Jour. of the Med. Sciences*, December, 1905). The case had been diagnosed hepatic cirrhosis, as were most of the other 23 cases on record and tabulated by Hess. He believes careful search would reveal more instances of this condition in cases which even at autopsy are otherwise pronounced cirrhosis. With the typical signs of cirrhosis of the liver, what should lead one to suspect obliteration of the hepatic veins as a cause? First, the history of the patient furnishing no cause for cirrhosis. Second, pain over the hepatic area or localized in the upper abdomen, one of the earliest and most constant symptoms of endophlebitis but exceptional in cirrhosis. Third, rapid swelling of the liver and development of ascites.

Nichols (*Med. News*, November 11, 1905) reports a

case of chylous ascites due to thrombosis of the receptaculum chyli which apparently occurred during the course of attempted collateral circulation in a case of atrophic cirrhosis of the liver. The conditions found showed that the obstructed blood current found a way from the veins of the mesenteric and lumbar lymphnodes into the lymph sinuses, vessels, and finally the receptaculum chyli. In this route a thrombus formed and obstructed the flow of chyle. Nichols tabulates 7 other cases, all that are recorded, of milky ascites associated with cirrhosis of the liver.

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"Mosquito Work in Relation to Yellow Fever on the Isthmus of Panama." W. C. GORGAS.

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"The Nose in Literature." P. TETENS HALD.

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"Carcinoma of the Breast, and Its Spread Into the Lymphatics." CHARLES BARRETT LOCKWOOD.

"Swellings of the Breast: Their Diagnosis and Treatment." ANDREW CLARK.

"Enucleation of the Prostate for Hemorrhage." SIR WILLIAM THOMSON.

"Ventrofixation." WILLIAM J. SINCLAIR.

"The Immediate and Remote Results of the High Operation for Varicocele, with a Report on the Examination of 100 Cases." EDRED M. CORNER and CYRIL A. R. NITCH.

"Secondary Carcinomatous Growths Simulating Tuberculous Hip-joint Disease and Miliary Tuberculosis." ROBERT E. LORD and CHARLES W. BUCKLEY.

"Simultaneous Excision of Two-thirds of the Stomach, the Anterior Face of the Pancreas, and the Transverse Colon for Carcinoma." CHAS. P. CHILDE.

"The Accurate Delineation of Tuberculous Foci in Early Disease of the Kidney in Women Before Operation is Undertaken." HURRY FENWICK.

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"Appendicostomy." LANZ.

"Treatment of Acute Perityphlitis." GRASER.

"Early Operations in Epityphlitis." GUNKEL.

"The Mechanical Factors Active in Producing Post operative Obstruction." WILMS.

"Studies Concerning the Colorless Cells of the Human Blood." SCHRIDDE.

"Concerning a Protozooid Microorganism in Malignant Tumors and Tumor Forms Produced in Animal Through Its Transplantation." SCHMIDT.

"Volvulus of the Sigmoid Flexure in Hirschsprung's Disease." DELKESKAMP.

"Case of Subcutaneous Laceration of the Intestine Operation; Recovery." HOEPFEL.

"A Case of Acute Nonsuppurative Thyroiditis." STALLER.

"Contribution to the Pathogenesis of Acute Articular Rheumatism." SEHLBACH.

"Remarks to Sonderrmann's Publication: 'A New Method for the Diagnosis and Treatment of Nasal Diseases.'" RETHI.

"Hans Schmaus." BOLLINGER.

"Sir John Scott Burdon Sanderson." DASER.

"Four Weeks with the Russian Army." COLMERS.

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"For Ethical Interests."—Those of the stockholders who were unable to be present at the annual meeting of the American-Medicine Publishing Company will be interested to learn that the sentiment of the meeting, as expressed in person and by proxy, was overwhelmingly in favor of conducting the journal, as regards its business affairs, "for ethical interests solely, irrespective of financial advancement." A resolution was passed instructing the management of the journal to adopt, so soon as possible, a standard for advertising "as high as that of the Council on Pharmacy of the American Medical Association," and to reject all advertising which shall not come up to the adopted standard. A full account of the other proceedings of the meeting will be published in a future issue of *American Medicine*.

The code of ethics is now coming in for some pretty severe handling, but from within the profession this time, which is a sign of health, not of disease. Outside criticisms are aimed at the general principles which have existed unchanged for millenniums and cannot well change as long as men exist in societies. Indeed they are based upon the laws of organizations. These inside criticisms involve details which must change from generation to generation as man changes the forms of his organization into societies. Life must be saved or prolonged now, as in ancient Greece, but the ways of doing it are vastly different. What suited the profession a generation or two back, when there were so few things to learn that all men were general practitioners, does not suit a state of affairs in which there is so much to learn that every man is a specialist even if he calls himself a general practitioner. Consultations are rarely, as they were originally, for mutual aid, but are generally for the purpose of calling in special skill. The old rules do not work well in their details, though their principles are fixed, so that there is an unfortunate tendency to revolt.

The harness needs adjusting, but it need not be kicked to pieces if it chafes. It is true, as stated by

Dr. F. R. Sturgis,¹ that parts of the code are trivial and childish, others negative or contradictory to present practice and therefore not representative. To subscribe to them in full is no doubt more or less hypocritical, but only in details. They are like the Pharmacopeia, representative of the past and in need of constant revision, because never up to the times. There is a growing resentment toward them, because they are not kept up to present necessities, and because a small minority of the profession is trying to dominate the whole. Whether this feeling is widespread or not, there is very great truth in the opinion that a code must be binding and not advisory. It must be so simple that all honorable men can follow it and it should be of such a character that violations can, upon conviction, be followed by revoking the license to practise. The lawyers disbar for certain acts contrary to their code, why not physicians, too? The growing need of organization will fail of realization unless its rules are up to date and in working order. There is need of considerable revision, now more than usually, because of greater recent changes in methods, but it must be acceptable to the nine-tenths who are outside the national societies. The altruistic beauties of the code will not be destroyed by eliminating some of the axioms known to every human being, and naturally subscribed to by all men, in or out of the profession. Nor is it to be forgotten that the code is primarily for the patient's benefit—only secondarily is it beneficial to the physician, and then merely to enable him to be more efficient. If its details harm the doctor, as many believe, then it defeats its own purpose.

Secrecy and the code have come in for gentle criticism at the hands of ex-President Cleveland as something discreditable to an enlightened people. So it is, but the trouble is that most people are not so enlightened as Mr. Cleveland and do not think as he does. It is doubtful, in addition, whether he has ever been sick

¹ New York Medical Record, January 27, 1906.

enough to need secrecy as an essential part of his therapeutic management. Furthermore, very sick people are not in the enlightened class. Nevertheless, he hits the nail on the head ponderously when he says "that fatiguing discontent with halting results of a mysterious and unexplained course of regular medical treatment leads directly to the camp of quacks and charlatans who not only cunningly guarantee speedy recovery, but capture the imagination and gratify caprice by an alluring and apparently frank explanation of the qualities and character of their remedies or treatment." After recovery from the mental dyspnea due to this sentence, we can only gasp, "Well, what of it?" We have all said the same thing before. An editorial writer in the *New York Sun* very properly states that we cannot adopt the methods of the quack; secrecy is infinitely more honorable than falsehood. He also shows that patients demand the present methods, and he might have added that it is adjusted to human characteristics and needs and is, therefore, what it is. Frankness may now and then be suitable to men of strong character, but for the rest it may be the depth of brutality. To tell all, is more than the average sick man can stand—ignorance of many things is his safety until he recovers. He might be scared into fits, if he hasn't got them already—perhaps proper, if we could always cure the fits. It is regrettable that this particular writer did not mention the fact that the increasing exactness of modern medicine is very distasteful to sick people, in a way, as it reveals incurable conditions so soon. We all prefer to drift on in darkness. When enlightened we naturally turn to the scoundrel who will assure us he can cure. It is wrong, nevertheless, to accuse the profession as a body of making a pretense to infallibility. The *Sun* has a fling at "that magnificent collection of platitudes . . . under the title of the Principles of Medical Ethics." We should expect that paper to revise the code, but if in its revised condition it doesn't suit the vast majority of sick men, it's their own fault. They should all have as much sense as Mr. Cleveland and the *New York Sun*.

Feeble-minded witnesses are certainly unreliable and therefore dangerous to the cause of justice in any case, but to depend upon one and one only for a conviction of murder seems inconceivable, and yet that is the charge now made in the celebrated Patrick case in New York. The attempt to use insane witnesses in New Jersey was but recently rebuked by the jury, which promptly decided that the testimony was worthless. An insane man may not interpret what he sees, and though he might tell what he thought he saw, it is so evident that no dependence can be placed upon it that the public has not yet ceased to wonder why a sensible

prosecuting attorney would think of using them. In the case of the feeble-minded the whole question hinges upon the credibility of the witness, a matter which enters into every piece of evidence. We have left the decision entirely to the jury, and, as a rule, they wisely reject tainted evidence, but in the Patrick case they accepted it, thus condemning to death a man whom many consider to be entirely innocent, or at least against whom there is no sure evidence. The surprise is not so much at the error of the jury—if it did err—as at the tendency of prosecuting officers to use worthless material. Prominent alienists have already decided that this particular witness was too feeble mentally to be depended upon, and the press now reports that in the application for a new trial there was presented a mass of testimony to prove that he had confessed that he had deliberately sworn falsely to secure immunity from trial for some other crimes.

There is also the usual conflict of experts, for very great doubt is thrown upon the evidence of certain physicians who believed they had found evidence of death by chloroform, though they had examined the body long after the arteries had been injected with embalming fluid. It is now asserted that they could not possibly tell anything about the matter and also that the manner of administering the chloroform—2 ounces in a cone placed over the sleeping man's face—would, by its irritation, defeat the purpose of the alleged murderer. The conflict of expert testimony is disgraceful enough of itself, but it sinks into insignificance in comparison to the error of accepting the evidence of a feeble-minded witness—and one who is tainted at that.

The rights of defendants have been so safeguarded in America that it is extremely difficult to convict, and it has been shown to be a natural reaction against the ancient legal procedure when they had no rights—not even a counsel. There is a growing public opinion that the prosecution shall not be so handicapped, as it is so difficult to convict murderers that human life in the streets will not be safe, indeed all crimes will be committed with greater impunity. Public policy demands the return swing of the pendulum, but if these new developments of the Patrick case prove to be well founded, there will be an end to the reform. If he has been convicted through defective or criminal use of wellknown laws of evidence, it is possible that the defendant is not sufficiently guarded instead of over-guarded. It is therefore a serious matter and involves far more than a mere question of the credibility of a witness and of the weight to be given to expert opinions. It touches the basic principles of trial by jury—a system

devised by northern races of Europe but hopelessly beyond the comprehension of the less intelligent races now flocking here. It also suggests to the psychologist the possibility that legal procedures are already so involved and cumbersome that the human mind is not able to guide them properly and that fatal errors of judgment at critical times may destroy the whole and result in miscarriage of justice as a rule and not as an exception. It is quite evident, at least, that our legal procedures are far from perfection. The allegation that the witness had been suborned to make a case against Patrick is incredible and practically accuses the prosecution itself of murder. Such statements and all his contradictory confessions must be given the same weight as the original testimony—and that is, none at all. No system of jurisprudence will work unless its officials are honest and not criminals themselves, and this is the presumption in the case at point. Still it is possible and it shows that the difficulty of conviction must continue for awhile, to avoid breaking down the barriers of personal protection against officialdom.

The proper payment for medical service has been considered by every human being and the views on the subject vary between quite wide limits. There are a few who think that such labor to save life should be a gratuitous public duty—they are generally poor and socialists at that. The average man when really in need of help is anxious to buy the best he can get. He does not stop at any cost, for he thinks that otherwise he might lose all. After he recovers—he changes his mind. Royalty and nobility are compelled to pay large fees, yet voluntarily, paradoxical as it may seem. It is immemorial custom—*noblesse oblige*. The big fees are never demanded, though failure to pay is resented as unprincipally. The subject demands that the sovereign be lavish in payment for every service and act up to his station. There is probably a bit of the same feeling toward the princes of the financial world. The niggardly rich are held in a curious kind of disrepute, if not actual contempt, if they act in a way a prince of the blood would not dare to. The subject has recently received more or less intelligent treatment in the lay press on account of a fee of \$1,000 which was demanded of a visiting British prince for some small dental services. It was paid, of course,—*noblesse oblige*—but the demand was generally considered to be in bad taste, to say the least. In Europe it would not have been made at all.

The subject of surgical fees has now come up for renewed discussion on account of some correspondence published by Dr. Robert T. Morris in the *New York Medical Record* (Jan. 6, 1906), in which his fee of \$1,000

for appendicectomy was considered too high by one fully able to pay, but not forced to pay by the law of *noblesse oblige*. She paid \$600; but after she had been given expert opinion from other surgeons, that the fee was not exorbitant—for her—she reluctantly, though pleasantly, paid the balance. The comments upon the matter bring to light the very general public sentiment that surgeons charge too much. "We do not question your ability" it is said, "but we feel you make us pay too dear for it." It is evident that if public sentiment was allowed to rule, the medical profession would be made an exception to all others, and no one permitted to lay by a competence for his old age. The earning power of the great man of wonderful abilities would be reduced to the level of the most stupid. A clergyman of great force is allowed by public sentiment to charge large fees—that is, accept a large salary—a lawyer's services are graded in value by his abilities, and so is the engineer and every other professional man except the physician. If this sentiment were to rule, the big men would be driven into other lines, for a man must look out for the welfare of his children. Medical art would be left to the inferior. The public would then get what they pay for and nothing more. It is an illustration of the injury people would inflict upon themselves if they had their own way. The men who can demand large fees are so few in number that it is really an academic discussion after all. They are rare exceptions to the great mass of the profession, some of whom are even content with 25-cent office fees and fifty cents a visit, and are not concerned with \$1,000 fees except as a matter of interesting news from some far-off professional sphere. Many a poor soul does not make \$1,000 a year. To a large extent it is a matter of environment—and fees are graded naturally according to the wealth of the community.

Medical and surgical services have no value, in that they are invaluable. That is, there is no measure by which they can be judged. All other professions, excepting the clergy, deal with property, and they are paid in accordance with the value of the material things they create or save. The lawyer gets 5% or 10% or whatever may be the unwritten custom. Sometimes he calmly takes all, of course. Life, on the other hand, is immaterial and without value. It is valueless or invaluable, according to the word we prefer, and cannot be measured in dollars. When it is destroyed carelessly, by railroads, for instance, the courts cannot direct compensation, for the loser is dead. The surviving family is damaged pecuniarily only to the extent of the deceased's earning power and is compensated in accordance therewith, but the life itself does not complicate the matter at all. There is an actual French case recorded in which

a woman complained to the court that she received but 2,000 francs for the death of her husband in a railroad wreck, while a man who lost his legs received 10,000 francs. The judge curtly told her that she could get another husband, but the man could not get more legs. It was flippant, yet it expressed the natural law of pecuniary damage for her, but personal damage to the man. Similarly, when a life is saved, no one can estimate the money value of the service, for it has none. A rich man has been known to pay \$50 to a veterinary for treating a horse, and refuse an equal amount to a physician for similar services to himself. The millionaire who pays his doctor \$10 for life-saving labors puts a correct estimate on his own life. Dr. Morris' correspondent evidently thought her relative's life was worth but \$600—and she ought to know. Recent dispatches from Vienna assert that Austrian physicians resent their fees. A veterinary for inoculating a cow gets 8 pence, or four times what the physician receives for a vaccination. From an inspection of some of the immigrants from that country, it is possible that a cow is worth four men, after all. Nevertheless, when Austrian tramps are arrested, the doctor who examines them receives less than the barber who cuts their hair.

The law of supply and demand regulates medical compensation to a very large extent. It is a natural phenomenon over which neither the profession nor the laity have much control. Where there are many physicians of equal ability, competition grinds down the fees. If the income drops below living expenses, the least successful leave the community or take up other means of getting bread and butter. The fittest survive and in every locality the composition of the profession is in a state of constant flux—never the same from year to year, and constantly regulating itself to the work to be done. When a man develops exceptional skill his services are demanded more and more—they are bid up by competitors on the other side. He is, indeed, compelled to raise his fees to prevent overwork—strange as that may seem. He would not be doing his duty by his patients if he tried to treat a hundred a day—and that many would crowd his offices if his fees were 25 cents. It is also a fact that a surgeon can do more now than ever before—a few can do wonders as compared with the surgeons of a century ago—and they receive more in proportion by the operation of natural law. How they gained this ability is immaterial to the question—indeed, not all have ability to profit by fortuitous opportunities to learn surgery.

Lives Are Not All Equally Useful.—There is a great deal of mushy sentiment written about the charitable work of exceptional men; they do no more nor less than every other physician, but anyone who neglects

the well-to-do so as to attend the ne'er-do-wells is, in our respect, a traitor to society. Every life, no matter how useless it is, must be saved if possible, but the greatest time and care must be given to the wage earners and in proportion to their usefulness to the social organism. If the Presidential train is wrecked, and the doctors summoned, would let the injured President die while they attended and saved the hobo who was stealing a ride, they might be doing right in a way, but every citizen would want to hang them. In other words, duty to society is a factor as well as altruism and fees—indeed it reflexly regulates the fees. The assertion that surgeons are like railroad officials, charging all the traffic will bear, or actual highwaymen crying, "your money or your life," is the insulting way success is greeted by thoughtless writers of the lay press. We must all learn the sad lesson which comes with white hairs. We are not so important as we once thought—someone else may be more worth saving than we, the rule in every organism—some units indispensable, others not. If someone else outbids us we must take what is left, and be thankful for that much. When a ship is wrecked, a civilized crew saves the women and children, but lets the men perish if need be. It is curious that there should be an opinion that doctors must not be as humane and civilized as laymen when it comes to a choice between lives of different value to society.

The altruism of the medical profession is a well-recognized and essential element, but it has been much overworked because misunderstood. Dr. W. S. Hall, of Chicago,¹ described it in a paper read before the American Academy of Medicine, and makes some statements which do not stand analysis. Altruism is as essential as egoism, but Herbert Spencer shows that neither can be excessive. They must balance. He who injures himself by too great altruism lessens his ability to do further good. The physician's altruism is really nothing more than a large share of duty to the organism, but he injures himself and the organism of which he is an important part if "he must subordinate self to the welfare of his fellowmen." He says: "The true physician . . . goes at any hour or in any weather, as well to those who cannot as to those who can remunerate him." If he did, he would be neglecting the better elements of society to save the worst, and would not be a true physician; in addition, he would be injuring the welfare of his wife and babies and be a bad citizen. It is time that all such degenerate sentimentalisms should be cut out of these discussions, and the physicians looked upon as human beings who will do their utmost to save life, but not to the extent of injuring better lives.

¹ Bulletin of December, 1905.

Altruism has Limitations and Charity Begins at Home.—He who destroys himself by helping others may be noble, but when we think of his poverty-stricken widow and orphans he shrinks into ignobility. The solution of the matter would come if none but the rich should study medicine, and the profession cease to be a means of livelihood—and this absurd proposition has been gravely suggested by one writer. The basis of any organization is the law that each unit can help itself while helping others, and consequently no profession can survive unless it is one of the means by which some can struggle for existence. It must be a money-making business or it will be unnatural. As well might we demand that farmers work for nothing, as we would perish unless they gave us food.

AMERICAN NEWS AND NOTES

GENERAL.

An Argument for General Vaccination.—The whaling brig Sullivan, of New London, Conn., recently reached Rio de Janeiro, after a month at sea, with the entire ship converted into a smallpox hospital, due to the fact that a third of the crew were ill with smallpox. The disease broke out near the Azores and spread until 9 sailors of the crew of 27 were ill.

To Clean the City of Mexico.—The Board of Health has received the necessary authorization and will institute at once a campaign against unsanitary conditions. Householders will be required to keep their premises clean and landlords must increase the supply of water in tenement houses. Bathhouses will be built at all police stations in the city. Persistent beggars will be banished from the city. The clothing of the very poor will be burned and they will be provided with new raiment. The congested population in the tenement district will be dispersed and inspectors of health boards will be vested with extraordinary powers. The recrudescence of fever among the lower classes, due to bad housing and improper food and personal filthiness, has caused a decided stand to be taken by the authorities.

To Amend Immigration Bill.—A bill amending the existing law has been introduced into Congress. It provides that in addition to the classes now excluded, that all persons who are of weak mind or who have ever been insane, or who have a loathsome or contagious disease or tuberculosis, or those persons "who are of low vitality or poor physique," should also be excluded. Further, it excludes all persons over 15 who are physically capable of reading, but cannot read either English or any other language. Steamship companies or individuals who bring immigrants under promise of employment are made liable for punishment for a misdemeanor and fined \$500 for each offense. One additional inspector and one additional surgeon are provided for each of the ports abroad from which immigrants are now sent to this country.

Post Exchange and Amusement Hall for Convalescents.—It is planned to furnish a post exchange and amusement hall for the use of patients of the general hospital at the Presidio of San Francisco. It has been found most desirable that, in addition to the 150 hospital corps men stationed there, the numerous convalescent patients have a place of recreation and amusement without being compelled to leave the hospital reserva-

tion, it being manifestly incompatible with hospital discipline to permit convalescents to absent themselves from the hospital reservation in search of amusement whenever they so desire; also it is not desirable to have the hospital corps men habitually absent from the reservation. It is believed that this plan will constitute an important factor in the treatment of patients, as well as aid very materially in their recovery.

EASTERN STATES.

Conference on Tuberculosis.—At a recent meeting in Lynn, Mass., the best methods of holding the disease in check were fully discussed. It was suggested that tuberculosis be listed as a contagious disease, and all physicians be required to report all cases to the Board of Health, so that proper measures could be promptly instituted.

Mortality in Boston.—The number of deaths reported to the Board of Health for the week ended February 10 was 244, as against 233 the corresponding week last year, showing an increase of 11 deaths, and making the deathrate for the week 21.38. The number of children who died under one year was 43, under five years 65, persons over sixty years 43, deaths in public institutions 89.

NEW YORK AND VICINITY.

An association for promoting the interests of the blind has recently been organized in New York City. The first work of the new association will be a careful registration of the blind of the city. A similar registration of the blind is now being made in Massachusetts by the older State association there. The New York association aims to stimulate among the seeing public, interest in the blind throughout the State.

New York's Vital Statistics for 1905.—During the year there were 172,259 births, 137,816 deaths, and 78,261 marriages, as against 165,014 births, 141,363 deaths, and 74,667 marriages in 1904. Based upon the population of the State as shown by the recent State census (8,067,308), the above figures show a birthrate of 21.3 per thousand population and a deathrate of 17. There were 1,554 deaths from typhoid fever, and owing to this fact State Commissioner Eugene H. Porter lays special stress on the question of the prevention of pollution of public water-supplies. The efforts of the Health Department to prevent such pollution "should be supplemented by legislation which will give it further control of potable waters of the State, by providing that all plans for public water-supplies be approved by the State commissioner of health, and also to secure inspection of proposed and existing sewer systems and water-supplies."

PHILADELPHIA, PENNSYLVANIA, ETC.

Woman's Medical College of Pennsylvania.—Dr. Clara Marshall has resigned from the chair of materia medica and therapeutics, the resignation to take effect at the close of the present session.

SOUTHERN STATES.

To Regulate Sale of Narcotics.—The Attorney-General of Maryland has drafted a bill to regulate the sale of narcotic drugs. It applies to cocaine, eucaine, and morphin, but not to opium. The burden of proof is to be on the accused to show that he did not know or could not have ascertained that the article furnished contained prohibited drugs.

Mortality Report for New Orleans.—During the week ended February 8, there were 124 deaths reported to the Health Department. Of these, 79 were among the white population and 45 negroes. Deaths in hospitals and other institutions, 26; deaths certified to by the coroner, 17. Deathrate per 1,000 per annum for the week, whites, 16.76; colored, 26.47; total white and colored, 19.36.

WESTERN STATES.

Fever Scare in Evanston, Ill.—An epidemic of scarlet fever, which already has closed two public schools in Evanston, is assuming alarming proportions, and it is feared by the Department of Health that all of the schools in the city may have to be closed in order to stamp out the disease. At present there are 23 cases of scarlet fever known to the health authorities at Evanston.

Hot Springs Citizens Win Fight Against Medical "Runners."—The Supreme Court of Arkansas has declared valid the State law passed in 1904 prohibiting the drumming of patients for doctors. It is held that the Visitors' Protective Association, of Hot Springs, was engaged in a lawful undertaking in endeavoring to have this law enforced, and should not have been enjoined from so doing by the lower court.

"Wrong Diagnosis" Called Robbery.—Dr. F. M. Steward, a physician, was found guilty of robbery by a jury in the Criminal Court of Chicago, Ill., last week, for "obtaining money from a well man, whom Dr. Steward diagnosed as suffering from heart disease, diabetes and catarrh." Felix Berard paid the physician \$110, but did not like the treatment and went to another doctor who said: "There is nothing the matter with you; your heart and kidneys are fine and you have no catarrh."

Nurses Become Probation Officers.—Miss Harriet Fulmer, head nurse of the Visiting Nurses' Association of Chicago, Ill., and 24 other nurses of the association, have been sworn in as probation officers. The reason given for granting the nurses the power of probation officers is that the homes they visit are usually of poor persons who cannot afford to pay for medical service, and with the new power the nurses can compel the parents to permit them to minister to the needs of the sick children. In most cases these children are known in one way or another to the Juvenile Court.

FOREIGN NEWS AND NOTES

GENERAL.

Fatal Accidents in British Collieries.—During the year 1905 there were 955 fatal accidents in the collieries of Great Britain and Ireland.

Scotland's Birthrate.—The annual detailed report on the births, deaths, and marriages in Scotland during the year 1905, just published, shows that the birthrate per 1,000 of the estimated population was 25.159, being the smallest birthrate recorded since the adoption of civil registration in Scotland.

Vaccination Methods in France.—It is said that in France, when smallpox appears anywhere in country districts, a calf with vaccine pustules is taken bodily to the place, and all the neighboring inhabitants are vaccinated, frequently in the street, and directly from the animal. The calf is sent from a central institution in Paris, and there are special railroad accommodations for its transport.

OBITUARIES.

John Slade Ely, February 7, from fracture of the skull, the result of a fall from a horse, at his home in New Haven, Conn. He was graduated from the College of Physicians and Surgeons, New York, in 1886. He was professor of theory and practice of medicine in the Yale Medical School, professor of pathology in the

Woman's Medical College, member of the American Medical Association, and the New York Pathological Society.

William E. Swan, February 8, at his home in New York City. He was graduated from the College of Physicians and Surgeons, New York, in 1890. He was instructor in the New York Postgraduate Medical School and Hospital, fellow of the New York Academy of Medicine, member of the American Medical Association, and the New York State Medical Association.

William M. Shoemaker, aged 84, February 9, at his home in Washington, D. C. He was graduated from Jefferson Medical College and the University of Pennsylvania, but never practised his profession.

John P. Devereux, aged 35, of Philadelphia, February 9, from tuberculosis, at the Polyclinic Hospital. He was graduated from the University of Pennsylvania, medical department, in 1894.

George A. Tower, February 5, from heart disease, at his home in Watertown, Mass. He was graduated from the Boston University School of Medicine, Boston, Mass., in 1877.

J. B. Littlewood, of Illinois, February 7, from heart disease, at his home in Washington, D. C. He was chief of the Division of Chemistry in the Patent Office in Washington.

Samuel R. Wooster, February 6, following an operation, at his home in Grand Rapids, Mich. He was graduated from Yale University, medical department, in 1867.

N. D. Young, aged 64, February 8, at his home in Youngsville, La. He was graduated from Tulane University of Louisiana, medical department, in 1867.

Robert Saylor Engler, aged 81, February 9, at his home in Philadelphia. He was graduated from the Medico-Chirurgical College, Philadelphia, in 1901.

Harrison Hathaway, recently, at his home in Toledo, Ohio. He was graduated from the Miami Medical College, Cincinnati, Ohio, in 1870.

THE PUBLIC SERVICE

Changes in the Medical Corps of the U. S. Army for the two weeks ended February 3 and 10, 1906:

Major HARRY M. HALLOCK, surgeon, is granted leave for twenty-one days, on surgeon's certificate.—Major GEORGE E. BUSHNELL, surgeon, is granted leave for one month, from about February 1.—LOUIS RANON, sergeant first class, Fort Des Moines, will be sent to Fort Omaha, for duty.—JOHN McNULTY, sergeant, upon his own application, will be placed upon the retired list.—Major JOSEPH T. CLARKE, surgeon, is granted leave for three months, to take effect upon the return to Fort Ethan Allen of Contract Surgeon Charles W. Thorp.—SAMUEL C. STANTON, contract surgeon, now in Chicago, Ill., will report to the commanding general, department of the lakes, for assignment to duty as assistant to the attending surgeon in that city.—Major EDGAR A. MEARNs, surgeon, is relieved from duty in the department of Luzon, and will proceed to Zamboanga, Mindanao, reporting to the commanding general, department of Mindanao, for duty as chief surgeon of the department.—First Lieutenant CRAIG R. SNYDER, assistant surgeon, is relieved from duty in the department of Mindanao and will proceed to Manila reporting at the Division Hospital, for duty.—First Lieutenant JAY W. GRISSINGER, assistant surgeon, leave for ten days granted January 19, is extended ten days.—Captain POWELL C. FAUNTLEROY, assistant surgeon, now at Fort Porter, will proceed to New York City for duty as surgeon of the transport *Sumner* during its voyage to the West Indies, and upon the return of the transport to New York City will rejoin his proper station.—JOHN F. LEEPER, contract surgeon, is relieve

from further duty in the Philippines Division, and at the expiration of his present leave will proceed to Fort Duquesne for duty, relieving Contract Surgeon Stephen M. Long, who will proceed to San Francisco, Cal., and take transport to sail from that place about March 5, for the Philippine Islands, where he will report to the commanding general, Philippines Division, for assignment to duty.—HENRY J. WALLS, sergeant first class, Fort Preble, will be sent to Fort De Soto for duty.—Colonel JOHN VAN R. HOFF, assistant surgeon-general, is relieved from duty in the office of the chief of staff, to take effect February 15.—First Lieutenant GEORGE H. SCOTT, assistant surgeon, leave granted January 20, is extended twenty days.—Lieutenant-Colonel WILLIAM H. CORBUSIER, deputy surgeon-general, will proceed to Vancouver Barracks and report to the commanding general, department of the Columbia, for duty as chief surgeon of that department.—First Lieutenant HORACE D. BLOOMBERG, assistant surgeon, will proceed to Fort Leavenworth for duty.—First Lieutenant HARRY S. PURNELL, assistant surgeon, will proceed to Fort Mackenzie for duty, relieving First Lieutenant Verge E. Sweazey, assistant surgeon.—First Lieutenant SAMUEL J. MORRIS, assistant surgeon, will proceed to Fort Schuyler for duty.—First Lieutenant LEON T. LEWALD, assistant surgeon, will proceed to Fort Slocum for duty.—First Lieutenant VERGE E. SWEAZEY, assistant surgeon, upon his relief from duty at Fort Mackenzie by First Lieutenant Harry S. Purnell, assistant surgeon, will proceed to Washington Barracks and report at the General Hospital, at that post, for observation and treatment.—First Lieutenant WILLIAM A. WICKLINE, assistant surgeon, now at Camp No. 1, Guinobatan and Jovellar Road, Albay, will proceed to Fort William McKinley, Rizal, for duty.—FRANCIS M. WELLS, contract surgeon, will proceed to Pilar, Sorsogon, for duty, relieving Contract Surgeon John L. Burkart, who will proceed to Camp Wallace, Union, for duty.—ALVA R. HULL, contract surgeon, now at Camp Daraga, Albay, will proceed to Camp No. 1, Guinobatan and Jovellar Road, Albay, for duty, relieving Contract Surgeon William O. Cutliffe, who will proceed to Camp Daraga, Albay, for duty.—First Lieutenant ROBERT B. GRUBBS, assistant surgeon, will proceed to Camp Wallace, Union, for duty.—The following assignments to and changes of station of officers are ordered: Captain EDWARD R. SCHREINER, assistant surgeon, to Camp Gregg, Pangasinan.—First Lieutenant FRANK C. BAKER, assistant surgeon, to Camp Stotsenburg, Pampanga.—First Lieutenant FREDERICK A. DALE, assistant surgeon, to Camp McGrath, Batangas.—First Lieutenant FRANK T. WOODBURY, assistant surgeon, to Cuartel de Espana, Manila.—First Lieutenant GEORGE F. JUEDEMANN, assistant surgeon, to Fort William McKinley, Rizal, for temporary duty.—GEORGE B. JONES, contract surgeon, now at Cuartel de Espana, Manila, will proceed to Camp Wilhelm, Tayabas, for duty.—Colonel JOHN VAN R. HOFF, assistant surgeon-general, is granted leave for fourteen days, to take effect upon his being relieved from duty in the office of the chief of staff.—Lieutenant-Colonel WILLIAM H. CORBUSIER, deputy surgeon-general, is granted leave for three months.—The advancement from the grade of first lieutenant to that of captain of the following-named assistant surgeons, with rank as captain from February 4, 1906, is announced: Arthur W. Morse, Frank C. Baker, and Henry S. Kiersted.—First Lieutenant CARY A. SNODDY, assistant surgeon, having reported his arrival at San Francisco, Cal., in compliance with orders heretofore issued, will proceed to Fort Barrancas for duty.—First Lieutenant LLOYD L. SMITH, assistant surgeon, now at San Francisco, Cal., is assigned to duty in the army transport service and will report to the medical superintendent of that service at San Francisco for duty.—First Lieutenant HARRY S. PURNELL, assistant surgeon, is granted leave for twenty-

one days.—So much of orders of February 2, as directs STEPHEN M. LONG, contract surgeon, to proceed to the Philippine Islands on transport to sail from San Francisco, Cal., March 5, is so amended as to direct him to proceed to the Philippine Islands on the transport to sail from San Francisco, about March 25.—ARTHUR W. HAYES, sergeant first class, depot of recruits and casuals, Fort McDowell, will be sent to Fort McPherson to relieve Sergeant First Class William D. Evans. Sergeant First Class Evans will be sent to the depot of recruits and casuals, Fort McDowell, Cal., reporting to the commanding officer, who will send him on the first available transport to Manila, P. I., for assignment to duty.

Changes in the Medical Corps of the U. S. Navy for the week ended February 10, 1906:

D. N. BERTOLETTE, medical director, commissioned medical director, with rank of captain, from April 5, 1905.—H. G. BEYER, medical inspector, commissioned medical inspector, with rank of commander, from April 5, 1905.—J. E. GARDINER, medical inspector, commissioned medical inspector, with rank of commander, from December 17, 1905.—G. M. DEVALIN, J. C. THOMPSON and F. L. BENTON, surgeons, commissioned surgeons, with rank of lieutenant-commanders, from March 3, 1903.—W. M. GARTON, surgeon, commissioned surgeon, with rank of lieutenant-commander, from March 12, 1903.—F. E. McCULLOUGH, surgeon, commissioned surgeon, with rank of lieutenant-commander, from June 9, 1903.—F. M. FURLONG, surgeon, commissioned surgeon, with rank of lieutenant-commander, from June 20, 1903.—J. A. GUTHRIE, surgeon, commissioned surgeon, with rank of lieutenant-commander, from December 15, 1904.—R. T. ORVIS, surgeon, commissioned surgeon, with rank of lieutenant-commander, from March 1, 1905.—D. B. KERR, surgeon, commissioned surgeon, with rank of lieutenant-commander, from April 5, 1905.—G. L. ANGENY, surgeon, commissioned surgeon, with rank of lieutenant-commander, from April 24, 1905.—R. E. HOYT, passed assistant surgeon, commissioned passed assistant surgeon, with rank of lieutenant, from May 8, 1905.—W. H. RONNIE, assistant surgeon, detached from the Naval Station, Cavite, P. I., and ordered to the Elcano.—J. R. DYKES, assistant surgeon, detached from the Baltimore and ordered to the Oregon.—J. P. DEBRULER, assistant surgeon, detached from the Elcano and ordered to the Oregon.—F. W. S. DEAN, assistant surgeon, detached from the Frolic and ordered to the Oregon.—C. C. GRIEVE, assistant surgeon, detached from the Oregon and ordered to the Frolic.—J. M. STEELE, medical inspector, commissioned medical inspector, with rank of commander, from December 16, 1905.

Changes in the Public Health and Marine-Hospital Service for the week ended February 7, 1906:

P. C. KALLOCH, surgeon, to proceed to Boston and New Bedford, Mass., on special temporary duty, upon completion thereof to rejoin station at Portland, Me., February 5, 1906.—J. A. NYDEGGER, passed assistant surgeon, granted seven days' leave of absence from February 5, 1906, under paragraph 191 of the regulations.—S. B. GRUBBS, passed assistant surgeon, bureau letter granting him twenty-one days' leave of absence from February 2, 1906, amended to read twenty-one days from February 7, 1906.—J. M. HOLT, passed assistant surgeon, leave of absence granted for two months from January 16, 1906, on account of sickness, amended so as to be effective from January 23, 1906.—W. M. WIGHTMAN, assistant surgeon, granted seven days' leave of absence from January 26, 1906, under paragraph 191 of the regulations.—J. A. MONCURE, acting assistant surgeon, granted leave of absence for thirty days from February 15, 1906.—W. S. WALKLEY, acting assistant surgeon, granted twenty-five days' leave of absence from February 6, 1906.

CLINICAL NOTES AND CORRESPONDENCE

[Communications are invited for this Department. The Editor is not responsible for the views advanced by any contributor.]

A MATTER OF PRIORITY.

BY

HOMER WAKEFIELD, M.D.,
of New York City.

To the Editor of *American Medicine*:—The older subscribers of *American Medicine* will recall that in the issues of November 22 and 29, 1902, I published the results of experimental deductions, reached prior to that date, as to the pathogenesis of cancer, a paper which was made the subject of a complimentary communication, in a little later issue of this journal, by the late Alexander Becker, and in the oration in surgery at the following meeting of the American Medical Association, it received the endorsement over all other theories, by the orator, Dr. Jonas. In this monograph I set forth an original theory of cancer etiology and pathology; to the effect that hyperplasia of neoplasms, instead of being due to an accentuated anabolism, is due to a stasis of katabolism.

Katabolism, involving as it does oxidation and autolysis (self-digestion of tissue), and oxidation involving oxygenation, alkalinity and katalysis, the stagnation of tissue digestion by physiologic, autolytic enzymes, I set forth as a cardinal feature of my deduction, thus accounting for a superannuation of degenerate and dead cells, as a sequence. I emphasized the importance of the activity of the cellular enzyme, which I emphasized as being of the alkaline oxidase type; and therein I quoted Croftan as likening it to trypsin¹ in physical attributes, beside directing attention to the fact that complete digestion of tissues is possible in alkaline solutions (Kölliker's method), thus implying that protolytic enzymes are formed by alkaline dissolved tissues, thus possessing the property of physiologic autolysis.

In a later paper (*American Medicine*, April 28, 1904), I emphasized the importance of counteracting the several factors of katabolic stasis in neoplastic therapy, and directed attention to the mistake of phototherapeutists and electrotherapeutists depending exclusively upon these agents, however valuable, to the exclusion of the other factors of the stagnation, which were of equal importance, and which should be used conjointly with the others mentioned.

In this last-named paper, I laid stress upon the importance of maintaining a balance, or equilibrium between the anabolism and the katabolism of the tissues, and I repeated the references to the evidence of katabolic stasis and to Croftan's contention that it (protoplasmic) is a ferment digestion, typical of protoplasm.

In a more recent article, I wrote and quoted authorities *in extenso* (*American Medicine*, March 18 and 25, and April 1, 1905), analyzing carefully all of the factors of etiology, physical manifestations and pathology, as well as the diatheses, predisposition, etc., their homogeneity, reciprocal relations, interdependence, therapy, etc.

The physical, chemical, biologic, physiologic and pathologic aspects have received attention and treatment.

Not being satisfied with the foregoing demonstrations of my contentions, I began about a year ago, an unabridged monograph on "Katalysis, Enzymes, Autolysis, Oxidation and Reduction" (completed about a month ago, but not yet published). In this last mentioned monograph I have set forth with considerable completeness, the physical chemistry of these subjects,

¹Trypsin is not identical with the intracellular enzyme, though it answers well for experimental purposes and is perhaps the most available for therapeutic applications.

their interrelations and dependencies, and in addition their applications to physiology and pathology.

In this paper I have again, only with greater completeness, described the enzymic with other factors of katabolism, and the typical alkaline-protoplasmic type of the cellular ferments.

Now comes the news by cable to the *New York Herald*, January 28, 1906, of demonstrations in the research laboratory of the Edinburgh University of the partial disappearance of the tumors of cancerous mice, by trypsin inoculations, in investigations prosecuted under grant of the Carnegie Institution of Washington, D. C.

It is to be observed that the developmental result of the Edinburgh research is but a repetition of my own findings of several years ago; but it should be emphasized that the former are but an integral part of my own conclusions, namely, that the hyperplasia of neoplasms, being a superannuation of cells incident to the stasis of katabolism, all derelict factors must be artificially provided for; oxygen for suboxygenation, trypsin for enzymic deficiency, alkalinity for acidity, and artificial katalysis of medicinal phosphorus, iron, arsenic, and iodine as permanent catalytic agents, and photo and electrical high-frequency currents as transient intensifiers of physiologic katalysis.

ADIPOSIS DOLOROSA.

BY

M. A. BLISS, M.D.,
of St. Louis, Mo.

A. M., Jewess, aged 32; married; housewife; one child, stillborn, 10 years ago.

Family History.—Father and mother said to have died from "heart failure." No history could be obtained of either, or of brother or sisters, which would throw any light on patient's history.

Personal History.—The patient had the ordinary diseases of childhood; lost hearing from otitis media, following influenza. Menses at 12. Scarlet fever at 14, following which she became excessively fat, so that her parents were asked to place her on exhibition. Progressive increase of fat continued until she was 30, becoming more marked at the knees, arms, and abdomen. The masses were painful when pressed upon and caused her much inconvenience in walking. Dyspnea occurred on slight exertion. Frequent attacks of bronchitis occurred and at times she expectorated blood. Skin became yellow and pain on movement increased.

Head, face, and hands did not show the adipose changes and were small compared to the rest of the body. Scalp well covered by moderate growth of fine hair. Eyes small, dull expression, some impairment of sight. Conjunctiva yellow. Gums spongy, teeth loose, many decayed, breath very offensive. Neck normal, thyroid gland small. The breasts were large and pendulous and flat. A pendulous mass from the abdomen hung down over the middle of the thighs like an apron and could be raised so as nearly to touch the chin. Similar masses overhung the knees and to a less extent the ankles. Masses were painful, did not pit on pressure and were nearly entirely anesthetic to prick of a needle. The skin showed striae. The muscles were not included in the masses. Knee-jerk absent.

Heart was not enlarged, systolic murmur at apex.

Lungs, coarse and fine rales over entire chest.

Temperature 99°. Respiration 33. Pulse 88, regular compressible.

Liver enlarged; slightly painful on deep palpation.

Urine: sp. gr. 1,020 to 1,026; trace of albumin, no sugar, no casts.

Patient lost strength progressively and died, six months after foregoing examination was made, of croupous pneumonia. No autopsy was made.

ORIGINAL ARTICLES

PUERPERAL INFECTION: REPORT OF SIX CASES
ILLUSTRATING ITS VARIED CHARACTER.

BY

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of New York City.

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Puerperal infection, in spite of the increase in our knowledge of prophylaxis, is still the cause of the majority of deaths occurring in pregnancy and the puerperium, and remains, therefore, one of the most frequently discussed topics in obstetric literature. Although the pathology of the simpler or so-called "pure" forms of infection have been thoroughly described, the varied manner in which the disease may manifest itself has not been so generally understood. It seems, therefore, justifiable to add, to a subject of such perennial interest, a report of several cases studied both clinically and pathologically.

Puerperal infection differs from all other bacterial infections in that it occurs in organs whose anatomic relations and blood supply have been altered temporarily. This is of as great importance in determining the extension of the infection as is trauma in favoring the original infection. Autoinfection is to be considered also, not only as infection from organisms existing in some part of the genital canal but also as infection which may be carried to the genitalia from some preexisting focus in a remote part of the body. Two cases of autoinfection from foci outside the genitalia are here reported. Intercurrent bacterial disease primarily non-genital must also be considered a factor in the causation of puerperal infection.

A few words concerning terminology may not be out of place, for the obstetrician is notoriously lax in his use of terms, *e. g.*, the frequent use of the term septicemia when only a toxemia exists.

In any discussion of infection we must consider on the one hand the local lesion and on the other the secondary manifestations. The local lesion is due to the toxic substance elaborated by microorganisms at the point of invasion; at the same time, these soluble substances pass into the general circulation and cause constitutional symptoms. The local lesion may be an abscess, a urethritis, or a pneumonia, etc.; in puerperal infection it is usually an endometritis. The constitutional symptoms constitute a toxemia and not a septicemia. The latter results only when the microorganisms themselves enter the blood stream and are distributed to all parts of the body. Needless to say an absolute diagnosis between toxemia and septicemia can be made during life only by the use of blood cultures. If, with the septicemia, we have the development of secondary abscesses, the condition then becomes a pyemia. Pyemic manifestations must, however, be distinctly sep-

arated from lesions of adjacent organs due to direct extension by continuity or contiguity. Thus we may have a streptococcus or other form of endometritis with toxemia or with septicemia; in the course of the latter pyemia may develop; or with either of the three conditions we may have local lesions due to direct extension of the infection. These terms include all possible forms of puerperal infection, but unfortunately, among surgeons and obstetricians the terms toxemia and septicemia do not receive their exact values.

Another stumbling block is the term sapremia, so frequently used for toxemia. Toxemia is now usually regarded as an intoxication resulting from the absorption of bacterial products. It is possible that an intoxication may be caused by substances elaborated in the bacteria-free destruction of tissue, but there is little positive evidence to this effect. By sapremia, obstetricians usually mean constitutional disturbances, as rise of temperature, pulse, etc., accompanying the retention of the products of conception. These symptoms are supposed to be due to the decomposition of the dead tissues by saprophytes with the production of the so-called "putrid endometritis." As the bacteriology of the puerperium has been more carefully studied, these cases of putrid endometritis are found to have as a basis, infection with those forms of pathogenic bacteria more difficult of isolation. This is shown by the recent investigation of Little,¹ who found *Bacillus aerogenes capsulatus* to be not infrequently present in the uterus; and also by the recent studies of gonococcus infection by Stone and myself at the New York Lying-in Hospital. It was found that the presence of the gonococcus explained a number of cases of toxemia with constitutional symptoms which would ordinarily have been classed as sapremia. It would seem advisable, therefore, to drop the old term sapremia and group these cases as toxemia from bacterial infection.

The cases* here collected illustrate some of the more unusual forms of puerperal infection both as regards the variety of causative organisms as well as the pathologic lesions.

CASE I.—*Streptococcic endometritis with septicemia; B. aerogenes capsulatus infection; acute yellow atrophy of the liver.* Records of New York Lying-in Hospital; Case No. 7,099; primipara; aged 25; pregnancy of seven months' duration.

History: Vomiting of pregnancy was moderately severe at fourth month; but improved towards the sixth. Two days before admission the patient induced labor by passing a button hook into the uterus, rupturing the membranes. Labor pains began shortly after and the child was partially expelled on the evening of the second day. On entering the hospital the os was dilated and the child delivered. The uterus was irrigated and packed with iodoform gauze. Vomiting was incessant at en-

* I am indebted to Drs. Lipes, Lochner, and Happel for the clinical histories of the cases from the Bender Laboratory and Drs. Painter and Stone, late attending physicians to the New York Lying-in Hospital, for permission to report two cases which occurred during my service under them.

trance, and there was slight jaundice. The temperature on admission was 102°; pulse 140. On the following day the gauze was removed. Patient was restless and noisy, but rational; vomiting severe; no abdominal tenderness. Third day, slight stupor; vomiting and jaundice increased. Fourth day, profound coma; vomiting severe; vomitus stained with blood. Fifth day, comatose condition continued; incessant vomiting; conjunctivas deeply bile stained and hemorrhagic. Patient died.

Urine: Analysis showed high specific gravity, a trace of albumin, a few blood cells, granular and hyaline casts and leucin and tyrosin.

Blood cultures were negative. Blood counts showed 3,950,000 red cells, 75 % hemoglobin and 18,000 to 19,500 leukocytes. The latter were divided into small lymphocytes, 7.5 %; large lymphocytes, 6.5 %; polymorphonuclears, 86 %.

*Autopsy** by Dr. Martha Wollstein. The autopsy was performed six hours after death.

Body is that of a medium sized woman, fairly well nourished; subcutaneous fat small in amount. There is slightly marked general icterus and a group of small subcutaneous hemorrhagic spots just below and to the left of the umbilicus.

Liver: Not decreased in size. In the mamillary line it extended to the free border of the ribs. Weight is 1,900 grams. The liver as a whole was light yellow in color and firm in consistency. On the inferior surface of the right lobe there were areas which were softer than the rest of the liver substance, and a brighter yellowish green in color. The lobules were indistinct everywhere, the central veins being plainly visible, apparently distended, but the lobules around them are not clearly outlined. In the softer areas the lobulation is almost entirely lost. Glisson's capsule is smooth and glistening, with many small hemorrhages in it and beneath it. The connective tissue septums are apparently not thickened. The branches of the portal veins are, for the most part, empty. Gallbladder contains green fluid bile; the ducts are patent. The blood in the portal veins foams, but there are no holes in the liver substance.

Spleen: Weighs 200 grams. Crackles on pressure. Dark red in color, soft, almost diffuent, and riddled with small holes.

Stomach: Contents dark brown and fluid less. The mucous membrane is covered with bloodstained mucus and shows punctate hemorrhages, most numerous on the posterior surface.

Kidneys: Normal in size; capsules free; cortex not thickened; markings blurred. In the boundary zone are many small hemorrhagic areas, contrasting sharply with the gray cortex and medulla.

Bladder: Punctate hemorrhages of the mucosa near the trigone.

Uterus: 16 cm. in length. Muscle is flabby and emphysematous, and peritoneal surface is normal. The endometrium is greenish black in color and gangrenous from the fundus to the lower border of the cervical lips. Attached to the mucosa at the fundus, to the left of the median line, is a mass of placental tissue which is gangrenous.

Anaerobic cultures were made from the liver, spleen and uterine wall. *Bacillus aerogenes capsulatus* grew from each of these organs.

Aerobic cultures from the liver and endometrium, gave growths of streptococci.

*Only those portions of the autopsy protocols pertinent to the subject under discussion are given.

Diagnosis of acute yellow atrophy of liver was confirmed by histologic examination.

Pathologic Diagnosis.—Puerperal uterus; gangrenous and emphysematous endometritis; general infection with *Streptococcus pyogenes*; acute yellow atrophy of the liver; pulmonary edema; chronic pleurisy.

CASE II.—*Double pyonephrosis; pyoureter; Staphylococcus pyogenes aureus septicemia.*

Bender Laboratory Records, autopsy 0-247.

Clinical history: Primipara. Patient was sent to the Albany Hospital for irrepressible vomiting when 8½ months pregnant. She was much emaciated and weak. Temperature was 101°-102° at night and usually subnormal in the morning. The vomiting which had persisted for two weeks was controlled by purgatives, dieting and saline enemas; but the fever persisted. The urine showed a few pus cells but no albumin. Patient was delivered at term of a dead child. Temperature went higher after delivery and the patient died on the same day.

Autopsy by Dr. George Blumer.

Left kidney: Measures 11 x 5.5 x 4 cm. The capsule strips readily. The surface of the kidney is pale and is dotted with purulent foci which extend into the kidney substance. On section kidney tissue is exceedingly pale. Occupying the pyramid in several places are small abscess cavities from 2 mm. to 12 mm. in diameter. These abscess cavities are surrounded by a distinct hemorrhagic zone. In some of the pyramids near the base can be seen minute pin-point opaque areas extending into the tubules. The pelvis of the kidney contains a small quantity of purulent material and the surface is somewhat hemorrhagic. The glomeruli are visible and the cortex measures 8 mm. in thickness. In numerous areas the infection can be seen extending up along the tubules. There is marked cloudy swelling. Left ureter slightly dilated.

Right kidney: Measures 11 x 6 x 4 cm. Capsule strips readily; surface is pale and is studded with numerous small abscesses. There is one retention cyst, 1 cm. in diameter, on the surface. On section, the tissue of the kidney is very pale and is thickly studded with small abscesses which appear to extend up along the tubules and in places show large areas of necrosis. As in the other kidney the abscesses are surrounded by a hemorrhagic area. The cortex measures 6 mm. The pelvis of the kidney is much dilated, contains a small quantity of purulent material and its mucosa is markedly hemorrhagic.

Bladder: Contains about 60 cc. of turbid straw colored urine; beyond some congestion, its mucous membrane is of normal appearance. The right ureter just where it passes over the pelvic brim becomes markedly dilated and at a point near the kidney measures 2.3 cm. in diameter. Throughout the dilated portion the mucous membrane is dotted with hemorrhages and in some places clots have formed. On the left side, 12 cm. above the ureteral orifice, the ureter is dilated and measures .75 cm. in diameter, while near the kidney it measures 1.75 cm. in diameter. The mucous membrane is hemorrhagic in places. Both ureters in the region of their entrance into the bladder are of normal appearance.

Uterus: Measures 16.5 x 11 x 8 cm. There are lateral lacerations of the cervix most marked upon the right side. The fundus of the uterus contains a considerable amount of clotted blood. The interior is much roughened.

and the surface is exceedingly irregular. Uterine muscle is of normal appearance. The vagina is much dilated and the mucous membrane shows numerous small hemorrhages. Ovaries and tubes are normal. Placenta is normal.

Microscopic Examination.—Kidneys: The greater portion of the substance shows marked cloudy swelling. Scattered here and there through the organ, usually along the group of tubules, are areas in which the kidney substance is densely infiltrated with cells, both polynuclear and small round cells. Some of these cells are in the lumen of the tubules, others are between the tubules. Associated with these lesions is a certain amount of hemorrhage between the tubules and a considerable degree of necrosis of the kidney cells. In some places there has been an extensive breaking down of the kidney substance with the formation of abscesses. The vessels are in places plugged with bacteria.

Bacteriologic Examination.—Cultures were taken from heart's blood, liver, spleen, both kidneys, pericardium and a mesenteric gland.

Cultures from the mesenteric gland and pericardium were sterile.

Cultures from heart's blood, liver, spleen and both kidneys showed a coccus in pure culture which liquefied gelatin, coagulated and produced acid reaction in milk and produced a marked yellowish growth on potato, corresponding in all particulars to *Staphylococcus pyogenes aureus*.

Pathologic Diagnosis.—Infection of both kidneys with cloudy swelling. Dilation of both ureters with pyoureter. Slight pyonephrosis. Acute splenic tumor. Cloudy swelling of liver. Swelling of mesenteric glands. Slight arteriosclerosis. Persistent Meckel's diverticulum. Enlarged uterus just after labor. Infection of kidneys by *Staphylococcus pyogenes aureus*, associated with general infection of blood and organs with the same organism.

CASE III.—*Periuterine thrombophlebitis; cerebral thrombosis with purulent meningitis; pulmonary embolism; streptococcus infection; pyemia.*

Bender Laboratory Records, autopsy No. 0-554.

Clinical history: Patient had an uneventful pregnancy until the seventh month. She then suffered from angina, which was relieved in two days by treatment with gargles and silver nitrate applications. She still suffered, however, from headache, photophobia, and restlessness; evening temperature elevated from 1° to 2°.

Two weeks later when 7½ months pregnant, premature labor occurred without intervention. At the termination of labor immediately after the placenta had been expelled spontaneously the patient suddenly complained of breathlessness, became cyanotic, and dyspneic, and died in less than two minutes.

Autopsy by Dr. George Blumer.

Heart: Right side contains fluid blood and postmortem clots. Endocardium and valves are normal and the average thickness of muscle of right ventricle is 4 mm. Left side contains postmortem clots; endocardium, valves and coronary arteries are normal. Auricular appendages are empty and foramen ovale is patent but is protected by a semilunar flap. Heart muscle is pale and opaque.

Left lung: Firmly bound down by old adhesions. It is crepitant and on section slightly edematous and congested throughout. Two of the larger pulmonary veins contain antemortem thrombi. Bronchi show slight congestion of the mucosa.

Right lung: Slightly adherent at the apex. It is crepitant and on section the upper and middle lobes are slightly congested and edematous. The lower lobe is markedly so. Vessels on this lung appear free from clots. Bronchial glands are slightly enlarged and pigmented.

Left kidney: Capsule strips readily, leaving a smooth surface. On section the cortex is markedly swollen and pale, the markings are indistinct and glomeruli are scarcely visible. Veins contain fresh thrombi and a fresh thrombus is present in the main branch of the renal vein.

Uterus: Measures 14 x 10 x 5.5 cm. The musculature is flabby, averaging 1.5 cm. in thickness and endometrium is rough; a mass of adherent material with the appearance of blood clot, is in the fundus over an area 5 cm. in diameter. The peritoneal surface is smooth. The tubes and ovaries are normal. Vaginal tissue about the cervix is cyanotic and shows a few hemorrhages. Veins in the broad ligament contain red and mixed thrombi, which are more numerous on the left side.

Brain: Shows, on the surface, three distinct areas of softening. The largest is on the right side at the vertex in the region of the first frontal convolution, the second is on the right side in the region of the upper part of the parietal lobule and the third is on the left side, just anterior to the fissure of Rolando, involving the ascending frontal convolution.

In connection with all these areas beneath the pia-arachnoid there are collections of yellowish green pus. The longitudinal sinus contains parietal antemortem clots and lateral sinus is free from clots.

Bacteriologic Examination.—Coverslips from the uterus show cocci in chains, not decolorizing by Gram, and bacilli decolorizing by Gram.

Cultures from spleen, bile, and meninges were sterile. Cultures from uterus and left renal thrombus show *Streptococcus pyogenes* and *Proteus vulgaris*.

Pathologic Diagnosis.—Thrombosis of veins of left broad ligament and left renal veins. Thrombosis of branches of the right pulmonary veins. Thrombosis of the longitudinal sinus. Multiple thromboses of cerebral vessels with areas of softening. Purulent meningitis over these areas. Chronic adhesive pleurisy on left side. Cloudy swelling of heart muscle, liver, and kidney. Acute splenic tumor. Puerperal uterus.

CASE IV.—*Suppurative salpingitis and perisalpingitis; lymphangitis; septic endometritis; general suppurative peritonitis from infection with the streptococcus, the gonococcus and the colon bacillus; septicemia.*

Record of New York Lying-In Hospital, Case No. 8410.

Clinical history: Primipara, aged 18.

Previous history: Six days before entering the hospital labor pains set in and the patient was delivered of a seven months' child by an outside physician. The child lived one hour. Bowels moved with an enema on the second day and at this time there was "fever" and abdominal pain. On the sixth day she was sent to the hospital, having suffered with pain in the lower abdomen and "fever" during this time.

Condition at entrance on sixth day postpartum: Pulse 110, high tension, regular. Temperature 104°, no abdominal tenderness. No rigidity. Uterus seems well involuted. Vaginal examination shows many valvular condylomas, profuse purulent vaginal discharge. The uterus is anteverted, soft, tender and fixed. Os admits one finger, no placental masses are felt. On palpation in

the lateral fornixes, extreme tenderness is elicited. Left appendage seems negative; but on the right there is a moderate sized fixed mass. No mass or swelling is found in the culdesac. Rectal examination corroborates vaginal.

Smear taken from inside the cervix shows gonococci and streptococci. Culture from the uterus showed streptococci in pure culture. Blood culture on the sixth day was negative. Leukocyte count was 29,000, of which 90.5 % were polymorphonuclears. Urine showed a trace of albumin with hyaline casts. Leucin and tyrosin were absent. The diagnosis at this time was septic endometritis with gonorrheal salpingitis.

On the seventh and eighth days her condition was unchanged. Bowels moved freely. Evening temperature was 102° with morning remission. There was slight pain in the hypogastrium. On the eighth day temperature was 103° in the evening and pulse 100. No abdominal rigidity was shown.

On the ninth day, after a large bowel movement patient complained of sudden and severe abdominal pain and difficulty in breathing. Pain was referred to the epigastrium and right lumbar region. It was peristaltic in character, intermittent, and intense. The tongue was dry and there was slight vomiting of clear green fluid. Pulse rose to 120, was thready and of high tension. Abdomen was very markedly rigid and tender. Expression was anxious and patient cried out with pain.

Vaginal examination showed slight fullness in the culdesac with marked tenderness, otherwise as before. Leukocytosis at this time was 11,000, of which 89.2 % were polymorphonuclears.

Patient was put on the operating table 4½ hours after onset of acute pain and rigidity. Laparotomy was done under ether anesthesia in Trendelenberg position with median incision.

On opening the peritoneum large quantities of seropurulent fluid escaped. Severe general peritonitis was present with marked congestion of the visceral bloodvessels. Peritonitis was most intense in the pelvic region. Appendix was adherent to right tube and ovary. Right tube was large, much thickened and inflamed and covered with tags of adhesions. Pus exuded from the fimbriated end. There were the remains of many recent adhesions in the region of the right tube and in the right side of the pelvis. Right tube and ovary were removed with the uterus, leaving the left tube and ovary and stump of cervix. The entire peritoneal cavity was flushed with hot saline solution. Iodoform gauze drain was passed through the cervix and abdomen closed by through-and-through silk-wormgut sutures, as patient's condition was poor. Death occurred after four hours without rally.

Blood taken from vein just before operation and placed on serum agar and ascitic agar yielded no growth.

Cultures taken at operation from the peritoneal pus, and from the fimbriated end of the tube showed *B. coli* and streptococci; from the inner end of tube, no growth; from the uterine cavity, no growth.

CASE V.—*Acute suppurative endometritis and salpingitis; acute fibrinopurulent peritonitis; puerperal infection (postabortive) with pneumococcus; pyemia.*

Records of the Bender Laboratory, autopsy 0-756.

Clinical history: Patient, aged 20. Para II, four months pregnant. Abortion was induced by a midwife by means of a catheter. Infection resulted. She was admitted to the Albany Hospital and the uterus was

cured and packed; but she died three days afterwards. Temperature was 102° at admission and ran from 102° to 103° until death from peritonitis.

Autopsy by Dr. Stanton.

Abdominal cavity: All peritoneal surfaces are covered with a sticky, greyish yellow, purulent exudate which is thin between adherent surfaces of peritoneum, but reaches 1 mm. to 4 mm. in thickness over the peritoneal surfaces held apart by collections of fluid. Omentum completely covers intestines, its free border reaching down into the pelvis, where it is covered with a thick layer of fibrinopurulent exudate. The pelvis and dependent portions of the abdomen are filled with a yellowish turbid fibrinopurulent exudate. The subperitoneal bloodvessels are everywhere deeply injected. The urinary bladder is distended, reaching 3 cm. above the pubes. Appendix measures 8.5 cm. in length, has a free meso-appendix, extends downward and inward over the brim of the pelvis and is negative, except for exudate on the peritoneal surface.

Uterus and appendages: These are covered with a thick layer of fibrinopurulent exudate. The fimbriated extremity of the left tube is turned upward, is deeply congested and exudes a thick creamy pus when the tube is compressed. Right tube extends downward, backward and outward, the fimbriated extremity lying behind and below the ovary, and is embedded in a thick layer of the fibrinopurulent exudate. Both tubes are deeply congested, somewhat swollen and on pressure a thick cream colored pus can be forced from both abdominal and uterine ends. Mucosa of the tubes is deep red in color and is covered with cream colored pus; ovaries are deeply injected and covered with a fibrinopurulent exudate.

Uterus: This is enlarged, globular in shape, extending upward to the level of the promontory of the sacrum, is distinctly retroflexed. Cervix measures 2.5 cm. in diameter and projects 1 cm. into the vagina. Cervical canal is dilated, easily admits one finger and measures 3 cm. in length; external os is deeply congested and covered with a yellow purulent material. Uterine cavity above the internal os measures 7.5 cm. in length; the muscle is firm; the inner surface of the uterus presents a grayish granular surface with areas of bluish black and deep red discoloration. There is no evidence of endometrium.

Vagina: Negative except for congestion and bluish discoloration in the region of the cervix. This is especially marked in the posterior fornix.

Right common iliac vein contains several grayish granular masses 3 mm. to 5 mm. in diameter, the remains of softened thrombus.

Bacteriologic Examination.—Smears from the peritoneum show numerous cocci in pairs and short chains with numerous bacilli of varying morphology.

Cultures from peritoneum, liver, spleen and kidney show numerous minute translucent slightly raised colonies on agar from which are obtained lanceolate diplococci staining by Gram's method. Subcultures from these minute colonies were sterile after 48 hours. On original cultures were also moist, semitranslucent colonies 1 mm. to 3 mm. in diameter, from subcultures of which was obtained a gas-producing bacillus which coagulated milk with acid reaction.

Cultures from the uterus showed a large number of organisms which were not worked out.

Microscopic Description.—Uterus: Mucosa has been removed. Muscular walls show narrow zones of necrosis adjacent to uterine cavity. Small bloodvessels near

cavity are thrombosed. Considerable leukocytic infiltration of all tissues with scattered masses of bacteria.

Tube is markedly congested and lumen is filled with pus. Serous surface is covered with an exudate of fibrin and leukocytes. All coats are infiltrated with polymorphonuclear leukocytes and lymphocytes. Fibroblasts with a few new formed bloodvessels are found beneath the exudate on the peritoneal surface. Gram-Weigert stains show numerous cocci in pairs and short chains, and long rod shaped bacilli.

Pathologic Diagnosis.—Acute suppurative salpingitis and endometritis. Acute fibrinopurulent peritonitis. Mural thrombus of right heart. Congestion and edema of the lung with hemorrhages. Slight cloudy swelling of liver and kidneys.

CASE VI.—*Acute hemorrhagic endometritis; acute suppurative peritonitis and pericarditis; septic pneumonia with pleuritis; Staphylococcus pyogenes aureus infection; pyemia.*

Bender Laboratory Records, autopsy 0-198.

Clinical history: After an apparently normal pregnancy, patient was delivered by a midwife and entered the hospital on the eighth day postpartum very profoundly infected. Death occurred 36 hours after, her condition being so bad that nothing could be attempted in the way of operative measures.

Autopsy by Dr. George Blumer.

Peritoneal cavity contains about 300 cc. of turbid purulent fluid. Both layers are dull, injected and covered with a small amount of fibrin. Intestinal coils and omentum are adherent to one another by fresh adhesions. Appendix is normal. Retrosternal glands are not enlarged.

Pericardial cavity: Distended with 250 cc. of turbid yellow fluid. Both layers are dull and slightly injected.

Left pleural cavity: Contains about 1,000 cc. of turbid serous fluid. Right pleural cavity also contains turbid fluid.

Left lung: Pleura is covered by layers of fibrin and lymph. Both lobes are crepitant and on section are congested and edematous. Bronchi are congested and covered with mucopurulent fluid. Bloodvessels are normal.

Right lung: Bound down by fresh adhesions on all its surfaces. Pleura is also covered by layers of fibrin and lymph. Lung is less crepitant than normal and lower lobe feels quite solid. On section lower lobe shows bronchopneumonic areas and elsewhere lung is congested and edematous.

Uterus is enlarged, subinvolved and measures 12 x 8 x 5 cm. Peritoneal covering is injected and covered with a plastic fibrinous exudate. Consistency is soft, os is patulous and escaping from it is a large amount of sticky bloodstained material. Tubes and ovaries are apparently normal. The endometrium is markedly congested and shows a few discrete submucous hemorrhages, the mucosa is covered with tenacious foul mucoid fluid. Uterine walls are 2 cm. in thickness. Mucous membrane of the vagina is congested and shows a few hemorrhagic points.

Bacteriologic Examination.—Smears from fluid of pleura, pericardium and peritoneum contain many polymorphonuclear leukocytes with round cocci, generally single, which do not decolorize by Gram's method.

Cultures from spleen and gallbladder are negative. *Staphylococcus pyogenes aureus* is obtained in pure culture from liver, pleura and uterine cavity.

Cultures from the bronchopneumonic areas of lung and from peritoneum show colon bacillus as well as

Staphylococcus pyogenes aureus. Kidneys give a pure culture of colon bacillus.

Pathologic Diagnosis.—General infection with *Staphylococcus pyogenes aureus*. Infection of kidney, lung and peritoneum with *B. coli communis*. Bronchopneumonia with edema of the lungs. Acute bronchitis. Fibrinopurulent peritonitis, pericarditis and pleurisy. Acute splenic tumor. Cloudy swelling of kidney. Subinvolved uterus with acute hemorrhagic endometritis.

DISCUSSION OF CASES.

CASE I.—Legg's statistics show that 69 of 100 cases of acute yellow atrophy occurred in females and in 25 there was the association of pregnancy. Thierfelder collected 143 cases, of which 88 occurred in females and in 33 instances it was associated with pregnancy. However, acute yellow atrophy is also found in association with many other conditions and with bacterial infections. Among the bacterial diseases may be mentioned typhoid fever, diphtheria, erysipelas, osteomyelitis and puerperal infection. Richter² has collected 41 cases of acute yellow atrophy in association with syphilis. Babes³ has reported 5 cases following streptococcus infection and Ballin⁴ has collected 10 cases following chloroform anesthesia.

Hyperemesis gravidarum is a not infrequent association with acute yellow atrophy. Stone⁵ reports one case of acute yellow atrophy with this association and collects a large number of others. Meyer-Wirz⁶ among other degenerative changes in the liver of patients dying from eclampsia found one case of acute yellow atrophy, not associated with puerperal infection.

The frequent occurrence of infection in association with eclamptic and other toxemias of pregnancy is well known. Schrieber⁷ in a statistical study, reports that out of 29 deaths with eclampsia 7 died of sepsis, and Meyer-Wirz,⁸ in 117 cases of eclampsia, had 35 deaths, in which puerperal infection had supervened in three and in an additional case there was septic pneumonia. However, the toxic symptoms, as shown by the vomiting, were not severe in the case reported here; but it seems that the association of infection and pregnancy is a factor of some significance in the production of acute yellow atrophy of the liver. Strictly speaking, this should, perhaps, be considered a complication of pregnancy rather than an example of puerperal infection. In view, however, of the probability of the infection beginning in the genitalia it may justly be considered here.

CASE II.—Pyonephrosis is a rather uncommon complication of pregnancy, but hydronephrosis and dilation of the ureters does not appear to be so. Olshausen⁹ has reported 16 cases of dilation of the ureter, in 12 of which the condition was unilateral and in 10 of these on the right side. This distribution is supposed to be due to the greater frequency with which the fetal head lies in the right oblique diameter of the pelvis. In this case the position was l. o. a., but the measurements of the pelvis were not noted. It may be possible that a

generally contracted pelvis with an obliterated promontory would permit pressure to come upon both ureters at the pelvic brim and cause such dilation of the ureters as occurred in this case.

Cragin¹⁰ in a study of 10 cases of pyelitis complicating pregnancy, states that according to Vinay¹¹ this condition depends upon two etiologic factors: (1) Pressure of the ureter by the pregnant uterus; (2) infection of the urinary tract above the point of compression. Cragin states that in his cases the clinical course was marked by right-sided pain, sometimes elicited only by palpation or sudden motion. A rise of temperature usually occurred. He states that irritability of the bladder with frequent micturition is common, but that "the infection is a descending one and cystitis, when it does occur, is usually secondary to the pyelitis and ureteritis."

The experiments of Rebdaud and Bonneau upon animals are quoted in support of this view. These investigators produced pyonephrosis by aseptic ligation of the ureter and the injection into a distant part of the body of streptococci or colon bacilli.

The case reported, because of the exemption of the bladder and the lower part of the ureter, seems to have been a descending infection. Staphylococcus infection in such cases is rare; colon infection is by far the most frequent cause according to the collected cases of Cragin. One instance of streptococcus infection has been reported by Vinay and one of gonococcus by Loy.

It is interesting to note in view of the recently advanced theory of the common origin of eclamptic toxemia and toxemia of pregnancy with vomiting that this case was admitted to the hospital for pernicious vomiting and that Meyer-Wirz in his 35 autopsies for eclampsia noted bilateral hydronephrosis and dilation of the ureters in one case.

Rochard¹² reports a case of severe bilateral pyelonephritis in advanced pregnancy with immediate recovery after delivery of twins. He quotes Kendirdjy's statistics of 62 cases among which there were only two deaths and advises expectant medical treatment, but states that if interference is necessary premature delivery should be the rule rather than an operation on the kidney. Cova¹³ has reported 21 cases in which nephrectomy was done with resulting abortion in only five. The danger of involvement of the second kidney is so great that it would seem preferable to remove the cause of compression of the ureter rather than to remove the kidney.

Fournier¹⁴ has reported two cases of this condition with varied course. In one there was gradual onset in the early months of pregnancy, premature labor and birth of a dead child at seven months. In the other there was an acute attack, nephrotomy and labor at term. Schwab¹⁵ also reports two cases, in one there was a history of gonorrhea and the infection was severe, but patient went to term. The second case was one of hydramnios and ran an apyretic course. The colon bacillus was the infecting

organism and a live child was born at 8 months of pregnancy. Schwab draws attention to the difficulty of diagnosis and of the difficulty of differentiating from appendicitis.

Cathala¹⁶ in a clinical and pathologic study of pyelonephritis in pregnancy states that there are two main causes: (1) Predisposing cause, the lessened resistance of the pregnant woman to bacterial infection and the retention of urine from compression with its associated congestion. (2) Determining cause, the penetration of the infecting organism to the kidney. He divides the clinical course into two periods: that of onset, in which there are symptoms of general infection, and that of attack, in which there are symptoms of chronic suppurative pyelonephritis. He concludes that the prognosis for the child is bad, for if pregnancy does go to term, the infant not infrequently is of small size and weak.

CASE III.—Periuterine thrombophlebitis is a most serious condition and is the most frequent predisposing cause of pulmonary embolism and sudden death in pregnancy. Grossman in a study of 51 autopsies upon puerperal women dying from infection found periuterine thrombophlebitis alone in 14 instances and associated with lymphangitis in 13 other instances. Other veins in addition to the hypogastric and ovarian were involved in all cases save one; in three instances the vena cava was also included.

Richter¹⁷ lays stress upon Mahler's sign ("Kletter symptom"), the rapid beat of the heart due to extra work and slight degeneration. He has collected results from 16,000 cases and found 78 cases of thrombosis and 20 cases of embolism; of the last 60 % were fatal. Mahler's sign was found in 98 % of these cases.

The thrombosis may be due to mechanical causes, but is more frequently associated with infection. The initial lesion in the case reported here would appear to be the infectious process in the throat. This case is possibly, therefore, one of autoinfection, as is the case of pyonephrosis.

CASE IV.—Gonorrheal infection in the puerperium has been much discussed among obstetricians and widely divergent opinions are held in regard to its incidence and its influence upon tissues altered by pregnancy.

Kronig's¹⁸ study of 179 cases of puerperal fever showed that *M. gonorrhoeae* was found in 50 cases, while Williams¹⁹ found the organism in 8 of 150 cases of puerperal fever. Vogel²⁰ in 24 cases of puerperal fever found gonococci 4 times, twice in pure culture and twice in association with streptococci. Foulerton and Bonney²¹ examined 54 cases with negative results. Stone²² and myself, in a study of 53 selected cases of pregnancy, found the gonococcus in 17. In three cases labor was premature.

Martin²³ kept under observation 13 cases of chronic gonorrhea during labor and the puerperium and in none of these was there any symptoms observed which could

be attributed directly to the venereal disease. There were no abortions, although in one case labor was hastened by an acute exacerbation of the disease. In four cases the puerperium was practically normal and in the remainder there was a rise of temperature coming on rather late. This the author considers characteristic of the disease.

Lea,²⁴ taking acute purulent conjunctivitis in the infant as a proof of gonorrheal infection of the mother, has collected 50 cases. In 60 % there was an uneventful puerperium, while 40 % had more or less acute inflammation of the pelvic organs. Acute purulent endometritis with pyrexia was the most common condition, while in 10 % acute pelvic peritonitis existed. All the patients recovered save 3, who were also infected with the streptococcus. In institutions, however, acute purulent conjunctivitis in the child is not a just criterion of the frequency of gonorrheal infection of the mother, for Holt²⁵ has noted the frequent transmission of gonococcus infection among infants that are segregated in hospitals.

The presence of a mixed infection of the gonococcus and some other organism is said to add greatly to the severity of the infection and many cases have been reported to sustain this view. However, the severity of the constitutional symptoms seems to depend more upon the extent of the anatomic lesion than upon the character of the infection.

CASE V.—Pneumococcic puerperal infection is an extremely rare condition and is usually an infection from without. Weichselbaum,²⁶ as well as Bar and Tissier,²⁷ have met this condition, and Cohn has described a case very similar to the one here reported. His patient after abortion developed a pneumococcic endometritis and later a fatal meningitis. Foulerton and Bonney²¹ also report a similar postabortive infection from pneumococcus with five other cases of pneumococcus infection following full term pregnancies. They conclude that the grade of infection is, as a rule, not severe and that their series of cases cannot be taken as a just indication of the frequency of this form of infection.

CASE VI.—General septicemia is not an infrequent termination of puerperal infection. The clinical course is usually that of a rapidly progressive acute infection and follows the same course as other septicemias not of puerperal origin. Streptococcus infection is the most frequent and severe type of infection after labor. If the number of cases studied by Czerniewski, Kronig, Williams, Vogel and Foulerton and Bonney be collected, it is found that of 498 cases in which the contents of the uterus was examined bacteriologically, streptococci were present in 200 (40 %). While streptococcus is so frequent, *Staphylococcus pyogenes aureus* is most infrequent. Foulerton and Bonney found this organism but once in 54 cases and it is but infrequently mentioned by other writers. *Staphylococcus pyogenes aureus* was found in two of the six cases in this study; in one the

infection was of the kidney and in the other an acute general infection of all the organs.

CONCLUSIONS.

A consideration of these six cases teaches many things in regard to the diagnosis and management of puerperal infection in the more advanced stages of the disease. It may be seen that while streptococcus infection is usually the most common and severe type of infection, other organisms which usually produce clinically mild symptoms, may run a severe course and cause death.

Autoinfection must be considered to include not only infection from foci of bacterial disease in distinct parts of the body. Pregnant women suffering from such distant infection require most watchful care. Autoinfection from the genital canal is probably more common than is generally supposed. This is indicated in a study by Bumm and Sigwart²⁸ of the bacteriology of the secretions of women in the later months of pregnancy. The streptococcus was found to be present in more than 38 % of the cases and they conclude that with very careful examination aerobic streptococci may be found in the secretions of at least 75 % of all women during pregnancy and the puerperium. Of the women having streptococci, 20.4 % had fever.

From this fact it may be seen that the presence of pathogenic microorganisms in the genital canal is by no means sufficient evidence upon which to base a diagnosis of puerperal infection, and even when combined with constitutional disturbances the first step only has been taken toward the proper diagnosis of the condition. The term puerperal infection should be broadened to include infection elsewhere than in the uterus, and the location and nature of such lesions should be recognized before any operative measures are undertaken. This can only be done by exact physical examination, examination of urine, blood, etc., and a proper knowledge of the varied anatomic manifestations of infection. The frequency with which pain is right-sided in hydronephrosis and pyelitis should be remembered in differentiating the diagnosis from appendicitis.

The utter futility, and even harmfulness, of curetment, if attempted in such cases as those here reported, is readily seen; and when the varied character and oftentimes widespread distribution of puerperal infection are considered, the explanation for the high mortality (over 70 %) of hysterectomy in that condition is obvious.

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CONGENITAL MALFORMATIONS OF THE HEART; A SERIES OF CASES.*

BY

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Congenital malformations of the heart, both singly and in their varied combinations, form a group of cases of perennial interest alike to the clinician and to the pathologist. The characters making up the symptom-complex during life, although not constant and hence rarely leading to accurate diagnosis of the exact lesion, are nevertheless quite well known; the possibilities of autopsy findings are bewildering. A study of over 600 reported cases, which by no means exhausts the enormous literature on the subject, reveals 45 different single or combined lesions of the heart and great vessels. This fact renders impracticable my original intention to classify the cases according to the nature of the malformation and I shall speak in particular only of those lesions (seven in number) which are represented by the specimens on exhibition. It is interesting to note, however, that the 46 cases of cardiac malformation found among the 3,875 autopsies, with complete records, performed at the Philadelphia Hospital during the past 13 years are grouped as follows:

Patent foramen ovale	31
Patent ductus arteriosus	1
Absence of auricular septum	1
Absence of anterior portion of auricular septum	1
Patent foramen ovale and patent ductus arteriosus	10
Patent foramen ovale, patent ductus, pulmonary stenosis, and perforate interventricular septum	1
Patent foramen ovale, patent ductus, and transposition of aorta and pulmonary artery	1

The figures for the first named lesion are so much lower than usually given as to suggest the overlooking of many small openings in the foramen. In the 50 autopsies I have held elsewhere than at the Philadelphia Hospital I have found three instances of patent foramen ovale.

CASE I.—*Ectopia cordis*: This specimen was recently acquired by the museum of the Jefferson Medical College

through the courtesy of Dr. George Cunningham. The child is a full-term male. The lateral halves of the sternum are ununited, except for a distance of 2 cm. at the lower extremity, the gap between the parts being 5 cm. wide. The heart is entirely external to the thoracic wall, the vessels passing in through an oblong and diagonally placed opening 2 cm. by 3.5 cm. in size. The organ is covered by visceral pericardium only and can



Case I.—Pectoral heart. (From photograph.)

be drawn some distance from the chest by exerting traction upon the great vessels. The latter structures as well as the heart are entirely free from the margin of the opening in the skin and underlying tissues. The auricles are rounded and project prominently; the apex is blunt and is formed nearly equally by the two ventricles. The heart is essentially normal in size. As observed by the nurse, the organ performed properly its functions while the child lived, a period of 23½ hours.

Ectopia of the heart may be associated with fissure of the sternum, exocardia or pectoral heart, as in the present instance, or with an intact sternum the organ may be situated in the neck, cervical heart, or in the abdomen, abdominal heart. Instances of the first named group are the most common and include those with entire separation of the sternum and those with superior and inferior defect, respectively. The condition is relatively rarely found alone, being usually accompanied by protrusion of the abdominal viscera. Peacock¹ cites 13 cases of the various types reported by others and describes another specimen in the Museum of St. Thomas' Hospital. Ballantyne² mentions 9 additional cases and states that others have been reported. He refers to 9 cases of the sternoepigastric type collated by Taruffi,³ but as the entire sternum and the abdominal wall to the umbilicus were divided, Ballantyne regards these cases as more properly belonging under gastroschisis. I have obtained references to three cases not included in the series mentioned.

When the halves of the sternum are entirely separated, the pericardium is usually absent; the heart itself may be normal or exhibit varied malformations. In a case of this type reported by Grant,⁴ the subject was a seven-months' fetus, which lived six hours in an incu-

* Read before the Pathological Society of Philadelphia, December 28, 1905.

bator. The halves of the sternum were 5 cm. apart at the upper and 10 cm. at the lower end and the extreme upper portions of the recti muscles were slightly separated. The visceral pericardium was reflected from the heart and joined to the skin. At each systole the heart was tilted upward, the apex reaching the chin.

An example of superior defect of the sternum is the case of Sidney Jones, cited by Peacock. It differed from my case in that the skin was prolonged over the great vessels and thence to the base of the heart, epithelium extending a short distance on the auricular walls. The child was born at the eighth month and lived 13 hours. When the opening involves the lower part of the sternum and the epigastric region, the pericardium is not usually present, and the person may reach adult life. In the case reported by Goode,⁵ the manubrium was intact, the heart protruding below through a foramen in the soft tissues just large enough to prevent the passage of the bloodvessels, with the covering of which the skin at the lower border of the foramen was continuous. The heart was normal in size and shape; it was kept bathed with olive oil and covered by a pasteboard cone. The child lived 16 days. In the absence of defect in the sternum an opening in the diaphragm may allow the condition of abdominal heart, with or without external tumor. In the case reported by Holt,⁶ a living child, aged 5 months, with umbilical hernia, the heart was situated below the ensiform cartilage, the circulation being fairly well maintained. Peacock cites the case of Deschamps who, at autopsy upon the body of a soldier, found the heart occupying the usual position of the right kidney, the vessels passing into the thorax through an opening in the diaphragm.

Ballantyne states that ectopia cordis is rare in human beings, and presents several difficult problems in teratogenesis; the theory of arrested development is permissible. Nonseparation of the membranes may prevent fusion of the body walls in the middle line and amniotic adhesions may hold the heart forward. In cases in which the heart is covered by skin, the pressure and adhesions may have ceased early enough to allow the walls imperfectly to close. As the presence of the heart external to the body is incompatible with the maintenance of life, an interesting question is raised by the case of Lannelongue. In that instance a thin membrane which covered the heart sloughed on the fifteenth day; the skin margins were then united over the heart and the patient recovered. It appears reasonable that when the conditions are even in the least degree favorable to surgical interference such a step should be carefully considered as a possible means of saving life.

CASE II.—Transposition of the aorta and pulmonary artery; patent foramen ovale; patent ductus arteriosus: This case has elsewhere⁷ been reported at length and will here be only briefly described. The subject was a male infant who died at the age of 34 days. At birth it weighed 7 pounds and the day before death, 7½ pounds. Respiratory difficulty was at all times present, and cyanosis was marked during the first few days. Later the blueness became less prominent, especially at short periods, during which it almost disappeared. The child died during an attack of labored and irregular breathing accompanied by extreme cyanosis. The pathologic diagnosis was: Transposition of the aorta and pulmo-

nary artery; patent foramen ovale; patent ductus arteriosus; hypertrophy of right ventricle; partial atelectasis of left lung; general visceral congestion. The heart is essentially normal in size. In thickness the wall of the right ventricle is 7 mm., of the left, 5 mm. Neither



Case II.—Heart, great vessels, and lungs from a case of transposition of the vascular trunks. Child lived 34 days. (A) Aorta which arises from the right ventricle. (B) Right ventricle laid open. (C) Innominate. (D) Common carotid. (E) Subclavian. (F) Left branch of the pulmonary artery; the right branch can be seen passing under the aorta and from the point where the right and left pulmonary arteries are given off by the main trunk; (G) the ductus arteriosus (H) arises and passes upwards to the aorta (A). (I) Left auricle. (J) Right auricle. (K) Left pulmonary vein. (L) Left coronary artery which arises 0.7 cm. above the origin of the abnormally placed aorta. (M) Left ventricle. Notice that the right ventricular wall is the thicker of the two. (N) Left lung. (O) Right lung.

the aorta nor pulmonary artery shows evidence of stenosis. The foramen ovale is patulous in the shape of a slit-like opening 0.5 cm. long. The ductus arteriosus allows with ease the passage of a probe 2 mm. in diameter.

Cases of transposition of the great vessels of the heart are not extremely rare, probably as many as 75 being recorded. The malformation in origin is developmental rather than fetal in point of time, being due to lack of rotation of the septum in the aortic bulb. It is incompatible with long life, practically all of the subjects dying before the age of 3 years. A coexistent opening in the interventricular septum favors the prolongation of life. There are no pathognomonic physical signs or symptoms of transposition and the diagnosis can be made only by inference; even this is rarely done.

CASE III.—Patent interventricular septum; pulmonary stenosis; patulous foramen ovale; patulous ductus arteriosus: This specimen was obtained at an autopsy held by Dr. Coplin at the Philadelphia Hospital upon a male child of 11 months, the diagnosis of the three first-named lesions having been made during life by the attending physician, Dr. McKee. The body was extremely emaciated and the gums were spongy. The cavities of the right side of the heart, which is a globular organ, were found distended with blood. The right auricle communicates with the left through an oblique slit in the foramen ovale 3 mm. in maximum size. The pulmonary artery arises from the right ventricle at about its normal position, the conus pulmonalis being narrowed. At its point of origin the artery is 7 mm. and 1 cm. beyond, 2 cm. in circumference, and the orifice is guarded by a single, very thick, crescentic leaflet. From the artery 2 cm. beyond its origin springs the ductus

arteriosus, which enters the aorta 2.5 cm. from its valves. The right ventricle at the base communicates with the left through a somewhat triangular opening in the membranous septum, the apex being directed toward the apex of the heart, and each side measuring 4 mm. in



Case III.—The lower line points to the opening in the interventricular septum, the upper to the ductus arteriosus.

length. As a result of this septal defect both ventricles open into the aorta immediately over the septum. The wall of the right ventricle is 7 mm., of the left 5 mm. in thickness.

Of this combination of lesions perforate interventricular septum is not frequent, though not at all uncommon. The opening is usually anterior or posterior, most often the former, to the pars membranacea or undefended space. Hart⁹ states that perforation of the membranous septum can occur only as the result of inflammation and is very rare. The fact that deficiency is usually in the posterior part of the anterior segment of the septum is of interest in connection with the question of heartblock as related to the auriculoventricular muscle bundle of His. The latter structure passes down along the upper edge of the muscular septum, where that tissue joins with the membranous portion and terminates below the root of the aorta. The possibility of interference with this band when the defect is in the posterior segment of the septum appears worthy of note, although I know of no recorded case of heartblock associated with such malformation. The presence of deficiency in any one of the three parts of the septum is not incompatible with the attainment of adult life. Cyanosis may or may not be a symptom of the lesion. Reiss has called attention to the fact that cyanosis may be absent in early life and later make its appearance.

Communication between the ventricles is due to maldevelopment of one of the several component parts of the septum, and not uncommonly occurs in connection with stenosis or atresia of the pulmonary artery. Keith⁸ furnishes an admirable discussion of this question in connection with a series of 30 malformed hearts

which he exhibited. Of the 185 specimens of malformation of the heart in the London museums, all of which he has studied, 113 show developmental error in the conus pulmonalis, and 22 additional organs congenital stenosis of the pulmonary valves alone. In a large number of the 113 specimens there is an interventricular opening. Keith directs attention to three features in the septal wall of the infundibular portion of the right ventricle, which are at present little noticed by anatomists. They consist of a furrow and two muscle bands, and their evolution, together with the expansion of the conus pulmonalis, has much to do with the closure of the interventricular foramen. The persistence of the foramen is usually accompanied by patulous foramen ovale. Antemortem diagnosis of ventricular communication is possible, as mentioned in the present instance. Most prominent is a murmur which is loud, systolic, or almost continuous in time, and may be heard over the larger part of the chest; it is loudest along the course of the interventricular septum.

Pulmonary stenosis is considered by the great majority of writers to be the most common of congenital malformations of the heart; this is well attested by the statistics of Keith, and by Peacock's 119 cases among 181 of congenital anomaly. Complete atresia of the artery is less common than is stenosis. Stifel states that of the cases of atresia the artery is only a string-like cord in 13%, the ductus arteriosus is open in 82%, the foramen ovale in 61%, and there is a defect in the interventricular septum in 76%. In simple stenosis the ductus is seldom, the foramen ovale frequently, open. In one of McCrae's¹⁰ cases of atresia, with deficient auricular septum and open ductus, a fetal systolic murmur was demonstrated to students before the birth of the child. In this subject there was also transposition of the viscera, a condition of which Arneill, in 1902, collated more than 300 cases. In some of these instances the malposed heart is also malformed, but the former condition does not appear specially to predispose to malformation. A mooted point regarding pulmonary stenosis is its influence upon the incidence of tuberculosis of the lungs. The common belief is that this malformation does favor the disease in question. Burke¹¹ regards this occurrence of pulmonary tuberculosis, which was present in all three of his cases, as due not to pulmonary stenosis, but to coexisting narrowing of the aorta.

Persistence of the ductus arteriosus is a postnatal malformation. It is exceedingly rare as a single lesion, being almost always associated with one or more other cardiac or vascular defects. Clinically, an interesting point is the possibility of diagnosis. An elaborate symptom-complex of the lesion is given by various writers, but the most prominent feature regarding it is the regularity with which it fails. Arnheim¹² reports a case in which what seemed a clear diagnosis of open ductus was not confirmed by autopsy and Burke¹³ cites three such cases. The latter concludes the assertion that the accentuation of the pulmonary second sound in pulmonary stenosis proves the existence of open ductus, though possible, is supported by absolutely no facts. He believes that such accentuation is an auric-

ular tone and is diagnostic of open foramen ovale, which was present in all three instances.

CASE IV.—*Absence of anterior portion of auricular septum*: This specimen is also from a Philadelphia hospital case, being obtained by Dr. Coplin from a woman

of 32 who died of carcinoma of the uterus. There had been no clinical evidence of cardiac anomaly. The opening occupies the anterior portion of the auricular septum and is 32 mm. in diameter. Cases of partial absence of the septum are not uncommon, of the entire septum rare; instances of non-closure of the foramen ovale are exceedingly numerous. These openings, even when of large size, are usually of little or no clinical importance, appearing to exert no direct effect upon the circulation. When a large auricular opening is present in cases of mitral stenosis, blood



Case IV.—Absence of anterior portion of auricular septum. The oval, light space just below and to the right is probably the closed foramen ovale.

may pass to the right auricle and give rise to jugular venous pulse in the neck. The possibility of paradoxical or crossed embolism must always be borne in mind in connection with such lesion.

In order to determine if the myocardium of malformed hearts showed histologic differences from that of normal organs, sections were made from the left ventricle in Case II and from both left and right ventricle in Cases III and IV. Microscopic study shows no noteworthy changes as compared with the usual histologic appearance of the normal myocardium nor is there appreciable difference between the two sides of the heart in the last two cases. The specimens, however, had been in preserving fluids for at least several months before this study was made and the findings cannot be regarded as conclusive.

The influence of heredity in the production of malformations of the heart appears to be positive. In a previous paper I cited several series which point to the active role of this factor. Of interest in this connection, though not exactly similar, is the case reported by Boinet.¹⁴ A woman of 23, who for three years had mitral stenosis, which followed pneumonia, died as the effect of a second attack of pneumonia and aborting a six months' fetus. Autopsy on mother and fetus showed similar lesions of the mitral valve in each, the process not being so advanced in the latter, although distinct fibrous nodules were present on the leaflets. The fetus was normal in every other respect and syphilis and tuberculosis could be eliminated as causes. Boinet considers it probable

that the first attack of pneumonia caused endocarditis in the mother and later this lesion was transmitted to the fetus.

It is a pleasure to acknowledge the aid in searching the literature of this subject rendered by Max Meitzner and H. L. Hull, research students in the Jefferson Medical College.

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CLEANSING OF MILK VESSELS: RELATIVE VALUE OF WASHING POWDERS.

BY

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of Philadelphia.

In the production of pure milk, the cleansing of milk vessels and utensils cannot be too strongly emphasized. It is next in importance to the health of the dairy cow for the reason that milk is polluted more frequently through the medium of filthy cans and bottles than in any other manner. An investigation which has recently been carried out, has made it very evident that the dairyman has a just cause for complaint against the dealer in the city on account of the condition of the cans which are returned to the farm. Many of these are returned without any washing whatever and the balance are only passably clean. Perhaps a reason for this gross negligence may be found in the great adhesive power which milk, on account of the butter fat it contains, possesses for tinned vessels and glass. The residue thus formed, if allowed to become dry and hard upon the side of the vessel can only be removed with difficulty. On the other hand, while still moist its removal is comparatively easy.

The many complaints received from dairymen concerning the condition of returned milk vessels induced the Bureau of Health to investigate the cleansing of bottles and cans used in delivering milk. It was found that in many instances, despite the fact that the Bureau had requested dealers to cleanse all milk cans, this request had been entirely disregarded.

The methods found in use are as follows: 1. Rinsing out cans or bottles with cold water usually at the hydrant. 2. Washing bottles and cans with a hand-brush and a solution of one of the various washing powders. 3. Bottle-washing machines, by means of water power, with a revolving brush and a solution of washing powder and rinsing in water. 4. The throwing of a jet of live steam into inverted cans. 5. Washing vessels by means of large machines constructed to throw powerful streams of hot washing powder solutions

into the bottles and followed by boiling water. 6. Washing with soap and water and cleansing and sterilizing in a steam box at ordinary pressure or in an autoclave.

1. The first method mentioned is almost necessary to remove the dregs of milk, but it will not remove the grease, and it leaves the can almost as dirty as ever, because the cold water has but little or no effect in dissolving the butter fat.

2. The second method is the one mostly used by the small milk shop dealer when he uses any. Frequently no hot water is used and the work is carelessly done. The washing powder solution is not strong enough to cleanse properly and many bottles are rinsed in the same dirty water.

3. This method is used by many of the large dealers. It is a very good method for removing grease and caked dirt from bottles; but it is hard on the hands of the operator and the results from a bacteriologic standpoint are not satisfactory. The rinsing of the bottles in hydrant water and draining is at best only cleansing in proportion to the purity of the hydrant water used, and this frequently contains large numbers of bacteria.

4. Throwing a jet of live steam into an inverted can for a few minutes. This method is used by some of the larger dealers, who have a great respect for the cleansing power of steam. Frequently this method only fixes the dirt already in the can and does not destroy the germs.

5. The fifth method mentioned has been investigated thoroughly and has proved most satisfactory. The washing of bottles and cans by a powerful stream of some hot washing powder solution with rapid solvent power pumped into the bottles will cleanse 95% of the vessels perfectly. Less than 5% must be removed from the machine and scrubbed with a brush. These are usually bottles that have been used by the householder as a container for some article other than milk. The bottles are rinsed with boiling water, which, pumped into them, removes the solution of washing powder.

Five hundred bottles have been watched going through this machine without finding one that had not been thoroughly cleansed and bottles were removed from the boxes and tested and found absolutely clean. This is probably the only rapid, practical method of cleansing and sterilizing milk vessels.

6. The sixth method is one that is used in a few of the best dairies and in almost none of the establishments of the dealers.

The scouring of vessels and then placing them for a half hour in a steam box and filling the box with steam is a fairly good method, but it is too slow and can only be used when a few hundred bottles are used daily. An autoclave, the best and surest appliance used in this work, is expensive and slow and is only applicable when a comparatively small number of vessels is to be cleansed daily.

The following tables show the results obtained from the use of the various washing powders in the cleansing of milk vessels.

These experiments show that the germ-destroying power of these washing powders is slight. Their cleansing power was next made the subject of inquiry.

DESTRUCTION OF GERMS BY WASHING POWDERS.

One part of washing powder added to 100 parts of milk which contained 4,580 germs per cubic centimeter and counts made in a half hour.

Name.	2,400 germs per cc. after 50 minutes.
1. Savagran	3,645
2. Wyandotte	2,100
3. Tassco	2,060
4. Clover Leaf	2,400
5. Lye	1,110
6. Washing Soda	2,400
7. Takanap	1,850
8. Gold Dust	1,850
9. Pearline	1,400
10. Soapine	3,460
11. Young's Pearl Borax	1,850
12. Evanston's Naptha Borax	5,000
13. Babbitt's 1776	

WASHING POWDERS IN THE CLEANSING OF MILK VESSELS.

Name.	Solubility in water.	Appearance when dissolved.	Presence of borax.	Action on heating
1 Savagran	Slowly	Yellowish	—	Burns black, melts and turns red matter.
2 Wyandotte	Quickly	{ Soapy { Clear	—	Fuses readily.
3 Tassco	Slowly	{ White { Soapy	—	Fuses with difficulty.
4 Clover Leaf	Very slowly	{ White { Soapy	—	Melts readily.
5 Lye	Quickly	Clear	—	" "
6 Washing Soda	Quickly	Clear	—	" "
7 Takanap Soap	Very quickly	Soapy	—	" "
8 Gold Dust	Very slowly	Soapy	—	" "
9 Pearline	Slowly	Soapy	—	" "
10 Soapine	Slowly	Soapy	—	" "
11 Young's Pearl Borax, C. P.	Slowly	Soapy	—	" "
12 Evanston's Naptha Borax	Slowly	Soapy	+	" "
13 Babbitt's 1776	Slowly	Soapy	—	" "

* Burns readily with a smoky flame and with an odor of rosin and fish oil.

The rapidity of solution of the washing soda and several other powders is slightly to their advantage.

RAPIDITY OF CLEANSING BY WASHING POWDERS.

Name.	Cost per lb.
1. Savagran. Slowly	5 cents
2. Wyandotte. Cleanses rapidly, equal to washing soda in rapidity	5 "
3. Tassco. Fairly rapid, third in rapidity	5 "
4. Clover Leaf. Fairly rapid, fifth in rapidity	5 "
5. Lye. Slowly	10 "
6. Washing soda. Cleanses rapidly	1 "
7. Takanap. Fairly rapid, fourth in rapidity	5 "
8. Gold Dust. Slowly	5 "
9. Pearline. Slowly	6 "
10. Soapine. Slowly	5 "
11. Young's Pearl Borax. Slowly	7 "
12. Evanston's Naptha Borax. Slowly	6 "
13. Babbitt's 1776. Slowly	6 "

It will be observed that sodium carbonate and powders which contain most of this chemical appear to cleanse most thoroughly and most rapidly. The powders composed of an alkali and a fat also cleanse well, but not so rapidly. Soap powders polish the bottles and leave a beautifully polished surface. The cheapness of sodium carbonate, the actual cost being about one-fifth of that of soap powders, is a point that will appeal to the dairymen using large quantities of such cleansers.

In actual experience it has been observed that while washing powders, when carefully used, will do the work for which they are intended, the result is often destroyed by rinsing in dirty water, thus rendering the vessel liable to infect anything placed therein.

The best results obtained from an examination of milk vessels in a number of milk shops and milk dealers' establishments and dairies are given below.

CLEANSING OF MILK BOTTLES AT MILK SHOPS.

May 11, 1905.

Milk Shop, No. 1.

Bottles were cleansed with brush and clover leaf dissolved in cold water and rinsed in cold hydrant water.

Two hundred cubic centimeters of sterile water was placed in a pint bottle and 2,000 germs per cubic centimeter were found in the water.

Milk Shop, No. 2.

Bottles were cleansed with savagran, placed in a tub of water, and brushed by hand and rinsed in cold water.

Two hundred cubic centimeters of sterile water was placed in a pint bottle after being washed in this manner, and 18,200 germs per cubic centimeter were found in the water.

Milk Dealer, No. 3.

Bottles were washed with brush and with savagran, three pounds to a half barrel of water, and rinsed in hot water and drained.

Two hundred cubic centimeters of sterile water was placed in a pint bottle after the cleansing, and 18,600 germs were found per cubic centimeter of water.

CLEANSING OF MILK BOTTLES AT CERTIFIED DAIRIES.

Certified Dairy, No. 4.

An autoclave was used in this dairy and bottles were found to be clean and sterile.

Certified Dairy, No. 5.

A good steam box (without pressure) was used in this dairy.

Two hundred cubic centimeters of sterile water was placed in each vessel, and number of germs per cubic centimeter counted.

Quart bottle.....	0 germs per cc.
Quart bottle.....	50 germs per cc.
Milk can.....	16 germs per cc.

Milk Supply, No. 6.

Bottles were cleansed with hot water containing a mixture of borax and washing soda, and were then rinsed in boiling water.

After this process 200 cc. of water was added to a pint bottle, and 15,000 germs per cubic centimeter were found. After these bottles were put into the steam chest for one-half hour and tested again in the same way they were found to be sterile.

Hospital, No. 7.

The cans were placed in a steam box, inverted, and the steam was thrown into and around the can.

Tested with 200 cc. of sterile water, 180 germs per cubic centimeter were found.

Dairy Farm, No. 8.

Buckets and cans were cleansed with a solution of washing soda and scrubbed with a brush, rinsed in cold water and a jet of steam turned on them for a few minutes, and then all were exposed to the sun for six hours.

Buckets were tested in the usual way, and showed 40 germs per cubic centimeter and a large milk can 750 germs per cubic centimeter.

Milk Dealer, No. 9.

Large bottle washing machine in use. This machine throws into the interior of the bottle, by means of a strong pump, a lye or washing soda solution, and as the boxes containing the bottles are pushed along they are rinsed by a stream of boiling water.

Many bottles were tested and all were found sterile.

Milk Dealer, No. 10.

Large machine for washing bottles in use. This machine was very similar to the one mentioned in No. 9. Tests showed that after washing, the bottles were all sterile.

From these experiments one may judge the results obtained even when the cleansing of bottles and cans is apparently done most carefully.

The filling of dirty milk bottles on the streets by the men who deliver milk in wagons and the return of milk cans to the farms and dairies without any washing whatever are matters which should receive prompt attention. This is of the utmost importance, because it seems the farmers have poor equipments for cleaning cans, and the city dealers pay even less attention to this important procedure. Needless to say, between the two the public gets impure milk.

Hundreds of reports have reached the Bureau of Health that the milk delivered at the door of the housekeeper in the early morning was sour before it could be used at breakfast. The cause of this condition of affairs may be traced to the disease-producing organisms from the cattle which infect the cans, and will continue to infect the milk until the can is properly sterilized. Further, the rapid fermentation of milk which is thus induced has been the means of thousands of cans of milk being lost. These are dumped by dealers or sold to foreigners in the slums to make cottage cheese. In a single day in September, 1905, 5,000 quarts of milk were dumped by one dealer.

This state of affairs is responsible for the rapid development of the so-called pasteurization, or rather renovation of milk, and in my estimation the only remedy for this deplorable condition is to establish at once at each milk receiving depot in this city a can washing and cleansing building, where all cans must be sterilized before they are sent back to the farms. This washing could be done more quickly, more thoroughly, and more cheaply by machinery. The expense should be apportioned among the dealers and dairymen.

This scheme has the following advantages: 1. Saving of milk that is now destroyed by rapid fermentation, due to infection from dirty cans. This alone should pay for the washing of the cans ten times over. 2. Saving of ice used to preserve milk that is eventually lost. 3. Saving of time. Cans could be collected and taken direct to the washer without unloading at the dealer's establishment. 4. There would be no temptation to use preservatives, the need for them being abolished. 5. Saving of space for the storage of empty cans. 6. Increased sale of milk, due to the public having regained confidence in its purity. 7. Saving the lives of thousands of children who are now fed on fermenting milk, the food value of which has been lost. 8. Prevention of epidemics of dysentery and other milk-borne diseases.

In the rush and hurry of the routine work in the dairies and milk shops the cleansing of vessels is considered a nuisance and is therefore frequently slighted or omitted. In a certain milk shop there has been no hot water used in the cleansing of any utensils for nine months. For many years the disinfection of houses has been removed from the hands of the householder for the better protection of citizens, and surely the disinfection of dirty disease-carrying milk cans is a problem that needs just as vigorous action upon the part of the health authorities. The dangers which have been much underestimated of carrying infection back to the farms and of typhoid being carried in the milk after the washing of cans in infected water on the farm would thus be abro-

gated. The establishment of such plants under the supervision of the health authorities would be an object lesson in cleanliness to the world. And, finally, it is only when such plants are established that cities will have the moral right to demand of dairymen in the country districts absolute cleanliness in the collection and handling of milk, the only food that will alone preserve human life for any great length of time.

FACTS ABOUT EATING.

BY

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The Roman soldiers, in the early history of that empire, were accustomed to eat one meal a day, and they were the hardiest of soldiers, subjected to great tests of endurance. Five hundred years before the Christian era, Hippocrates, the great Greek physician, said in effect, "It mattered little whether a man ate once or twice a day." Two hundred years after the Christian era, Celsus, another physician known in history, said, "He thought it better one should eat twice a day." One hundred and fifty years after Celsus' time, the Roman people were eating three to five times a day, as the Americans and some other civilized nations are now doing. This was in the days of Roman wealth and luxury, the days which preceded and were associated with the decline and decay of that great State. During the Boer war, the British soldiers marched and fought on one meal a day, with coffee in the morning, and they maintained health and strength on this ration. The Japanese soldiers have been put to even greater tests. The accumulation of wealth has never directly destroyed a people, but physiologic gluttony, following its acquisition, with all that results in its train, may have done so.

We eat, or should eat, to keep the blood pure and bright for the nourishment of all the tissues. If this can be done in an individual case on one meal a day, properly eaten, then one meal a day is sufficient, or two meals a day may be required, depending somewhat upon the age and occupation. Three meals a day are seldom needed by persons past 50 who are engaged in intellectual pursuits. Nothing is more wholesome than the hearty appetite of a healthy man under self-control, and nothing more artistic than a graceful woman eating daintily. Compare this picture with the average guest at a hotel table who orders five or six dishes, aside from the main portion, only to mutilate each, and who then departs leaving behind quantities of unsightly food. A hen eating hot cornmeal does the same thing; she hurriedly gobbles down from every available pile all she can hold, and then runs around with her mouth open trying to cool off. A hen has just a little sense. It is far better to pay liberally for a napkin, the tablecloth or the music, than for food that is not needed, only to waste it, for food eaten habitually in excess, or unfairly eaten, finally

disorders the system or results in disease. It never seems to occur seriously to parents that the chronic ailments from which they suffer, with more or less regularity, and for which they consult the family physician, and take the children with them, are due in the main to their habits of eating, and that in time their children, if allowed to eat in quantity or combination, and in the same manner as they do, will in their turn become sufferers from the same disorders. With most parents this vital subject is allowed to pass as something beyond the ken of children and not properly a part of their early education. Children are usually born healthy. Heredity has comparatively little to do with "grown-up" aches and pains. Transmitted diseases ought to show in infancy and childhood. Children are nearest their parents then. Most of the chronic ailments discussed in this paper develop later in life. If water were the only food required, it would be easy to see how many "eat" their troubles, aside from those they borrow worrying about themselves or their neighbors. Sick headache (mixed migraine), biliousness, hyperacidity, duodenal ulcer, spastic constipation, chronic rheumatism, bronchitis, asthma, postnasal catarrh, eczema, acne, pruritus (itching), neuralgia, insomnia, cerebral hemorrhage (apoplexy), arteriosclerosis (hardening of the arteries), Rigg's disease (loose teeth with retracted gums), frequent urination, physical weariness (that tired feeling), obesity in some of its forms, and many other ailments and conditions are amenable to, or can be ameliorated by intelligent and persistent dietetic treatment. When any of the foregoing disorders are present there is or has been overeating of some sort, too much eating of one kind of food, meals are taken too near together, there is "nibbling" between meals, the food taken is not being properly insalivated, it is being washed down by liquids in excess taken with it, or after meals independently of the food ingested.

The normal stomach holds three pints. Many stomachs hold less. One or two pints of gastric juice are secreted by the stomach for the digestion of each meal. The stomach does not absorb liquids, it is not elastic. Liquids habitually used in excess weaken the muscular power of the organ, and dilute the gastric juice during digestion. In view of these facts, not more than two glasses of liquid should be taken at a meal and but one when soup is eaten. Liquid nourishment is to be sipped or spooned, that is, it is to be eaten, that it may become mixed with the saliva. Liquid nourishment, taken between meals, before the stomach is empty, usually disturbs digestion. It should always be thin in character, something that will not take away appetite for the next meal, as semisolid or solid food is prone to do. Clear coffee, chicken broth, lamb broth, barley broth, oatmeal tea, clam water, whey and milk one-half vichy are among the best. But the practice is a bad one and should be avoided. "Faintness," "goneness," and other symptoms of indigestion that invite this practice, may be due to it; they

should be ignored, not indulged. These symptoms are quite as much nervous or mental as physical. The pernicious practice of taking iced, semisolid food at soda fountains, between meals, cannot be condemned too earnestly. This habit lays the foundation for innumerable ills, if they are not already present. Water alone may be taken at a draught. Icewater had better be held in the mouth till it becomes warm; it checks the flow of saliva and should, therefore, be avoided when eating starchy food. Five hours after a meal is the best time to drink water freely, or one hour before the next meal. Four glasses of water a day, aside from that taken at meals, is the amount ordinarily indicated.

The normal stomach empties itself in six hours, depending somewhat upon the meal. Three meals a day as usually taken do not allow time for this, at least not among brain workers, in view of their sedentary life, with much of the nervous force, that should properly be helping digestion along, diverted to other channels. It is a good plan to go without food during the hours of greatest mental activity, especially if there is any weakness of digestion. As the result of too much food, or too many meals taken too near together, one meal being put into the stomach on top of another but partly digested, the intestines become filled with the illy prepared products of imperfect digestion. These products are sucked up and enter the blood current, rendering it impure. In turn they congest the connective tissues of the body. The system becomes clogged and the circulation retarded. Then follows, in all likelihood, some of the disorders enumerated or something worse.

It has recently been demonstrated beyond cavil that $1\frac{1}{2}$ pounds of mixed food a day, as it comes to the table, if properly eaten, will sustain a man weighing 165 pounds at hard labor. This would be represented by an egg, chop, moderate slice of roast beef (10 ounces), by a baked potato, saucer of peas, a few lettuce leaves or slices of tomato (7 ounces), by two or three apples or other fruit equivalent (6 ounces), by half a loaf of bread, six slices (6 ounces), butter (1 ounce)—approximately two pounds. Water as indicated. Tea or coffee in place of water, in part, preferably without cream or sugar. The old estimate of three pounds per day is undoubtedly in excess of physiologic requirements under ordinary forms of stress. It follows from this—that meals are better served six or seven hours apart. Food should be triturated by the teeth and tongue until dissolved or the taste is out of it, and any residue left should not be swallowed, but removed from the mouth. The stomach of civilized man resents being used as a waste basket. These can be bought at any kitchen emporium, where they sell anything from a tin dipper to a diamond. A sound stomach in men past 40 is hard to find. The proper digestion of food by the mouth lessens the desire for more than is required, and also lessens the requirement because of better assimilation.

The stomach should have time to empty itself and rest as any other piece of working machinery is allowed to do, even if not made in a blacksmith's shop.

In sick headache, chronic rheumatism, arteriosclerosis, and Rigg's disease, it is well to lessen the ingestion of starches, sugars, and red meats, or other highly nitrogenous food. These foods raise the arterial tension, while sugars ferment. In headache, biliousness, and obesity, the "no-breakfast" plan usually works well. In chronic bronchitis, asthma, postnasal catarrh, eczema, acne, pruritus, physical weariness and obesity, the starches and sugars should be curtailed. Sugars, for those suffering from any of the disorders enumerated, on account of their local irritant action, in concentrated form, on the stomach mucosa, and because of the alcohol-acid fermentations they set up, should be limited. The metabolized waste of starch and sugar is eliminated by the lungs, and if taken in excess, clogs the connective tissues in them and in the bronchial tubes. A good combination for those who insist on sweet in some form is, sugar of milk, one pound, saccharin, one-quarter to one-half teaspoonful (dram), according to taste. Maple sugar is a good sweet, it is less irritating than granulated sugar. Sterilized honey goes well in the morning (sterilize for half an hour in a double boiler). Fruit sugars are the most fermentable of any when mixed with other foods in the stomach. In eczema and acne, the use of stimulating foods and beverages, such as tea, coffee, red meats and condiments, must generally be denied. A low tension, nonstimulating diet would be represented by twice cooked cereals and fruit. In scrofulous eczema fats are indicated, while starchy foods act badly. In acne and urticaria fats do harm. Neuralgia and insomnia yield to a carefully eaten restricted diet, insomnia generally in three weeks' time. The practice of giving milk, fruit or other food at bedtime to induce sleep is undesirable. Sleep follows more quickly, but it is not restful. The recipient wakes soggy and dull, with a tongue that appears and feels like a piece of an old flannel petticoat. Spastic constipation can be relieved usually by two meals a day, one of cooked fruit mainly and the other of vegetables. Fruit acts better when eaten alone. Apples, apricots, peaches, prunes, dates, raisins, and steamed figs may be used. Tomatoes and onions should have the preference among vegetables, while spinach, lettuce with oil, asparagus and cooked celery are beneficial. Rye bread is helpful, also gluten and bran bread. As this form of constipation is due to hypertrophy of the circular muscular fibers of the intestines, eating to excess, or eating food that is too stimulating, is plainly contraindicated. On a restricted diet the bowels may not move daily, but if the food is properly eaten, the stools will be normal in character and consistency when they do act. When the bowels move two or three times a day, the person

so afflicted is highly nervous, neurotic, or he is eating too much; his intestines are simply wearing themselves out in a vain effort to get rid of an excess of poorly digested food. Obesity is a many sided problem. No attempt will be made to discuss it here in detail. When not due to physiologic gluttony it will often be found associated with "nibbling" between meals, or with eating some one fattening food in too great quantity, or with the free use of liquid at meals, which, serving to retard the digestion and circulation, favors the deposition of fat. Liquid with meals increases the desire for food. Green vegetables, freed from water, the harder they are to digest the better, by keeping the intestines busy, ward off appetite and burn up fat. Old vegetables may contain starch and prove fattening. The lean man need not flatter himself that he can eat with impunity anything in sight. He is equally liable to any and all the disorders enumerated, except obesity, if he regularly over-eats. He will often gain in weight if he eats less. He is likely suffering from the "starvation of overfeeding," a matter of common observation in leanness. Put a thin man on two meals a day, and instead of the usual breakfast, give him olive oil in orange juice, and the chances are he will speedily gain in weight. Add from one to four tablespoonfuls of olive oil to the juice of two or more oranges, mix thoroughly, and eat slowly with a spoon. His treatment, if ill, in no wise differs from that of the fat man, or others suffering from the disorders mentioned. But it is not so much a question of individual foods as it is one of control in habits of eating, and of restriction of food to the actual physiologic needs of the system. If diseases are to be cured or unorganized exudates absorbed, the restriction must be carried to the point where the system lives for a time and in part, at least, on the waste locked in its tissues and carried in the blood. This is simply a matter of "cleaning house," and the food, like the sail of a boat, must be trimmed flat enough to allow the body to weather the conditions present. It is dosing with self-denial for a purpose. This takes time, one month, three months, a year, even longer. Phillips Brooks said character is the greatest thing in the world, and this treatment affords a chance for some people to find out how much of that precious article they possess. Starches and sugars are the foods that common experience has shown are the most likely to clog the system. Meats or other foods require to be controlled, depending on the indications.

CASE I.—Paraplegia of cerebral origin, in a man of 67, with loss of control of the bladder. The muscles that move the eyeballs were also affected. Complete recovery was established in four months' time, except for the permanent loss of function of the internal rectus muscle of one eye. At the time of serous exudation or hemorrhage the patient weighed 196 pounds; at the time of recovery 165 pounds. He has since lived (four years) on one meal a day and has had perfect health. His weight remains constant at 165 pounds. He is five feet six

inches in height. During the first two weeks of his illness he was given nothing but water, after that liquid nourishment was allowed three times a day, and after he began to move about his room, he was given solid food once a day and the one meal plan was adopted.

CASE II.—Vertigo in a man of 69, the attacks of blindness occurring any time and lasting two hours or longer. Duration, five or six years, at intervals. There was a history of neurasthenia, migraine, and the examination disclosed general arteriosclerosis. Patient weighed 146 pounds. Height 6 feet. The vertigo might have been classed as neurasthenic, lithemic, gastric, due to arteriosclerosis, or old age, for which the treatment varies considerably in the textbooks. Patient was relieved in two months' time on two meals a day, and he gained $1\frac{1}{2}$ pounds in weight in that time.

CASE III.—Chronic duodenal ulcer in a man of 48. It had resisted all forms of treatment for nine months. There was a history of severe hemorrhage, per rectum, on three previous occasions within four years, constant hyperacidity, moderate dilation of the stomach. Ulcer healed after a fast of 21 days. Meanwhile patient went about; he walked in the woods, rowed a boat, fished, read books, wrote for the press and in other ways occupied his time. All tenderness was gone from the region of the ulcer, on pressure, in two weeks' time, but as the pain of hyperacidity persisted, recurring regularly each afternoon (for 18 days), it was deemed best to continue the fast. It was thought, by this means, aside from curing the acidity, that the morbid material in the vicinity of the ulcer might be absorbed. Exercise was encouraged for the same reason. It was believed it would help burn up the waste that tends to keep these ulcers active, and at the same time promote elimination. Patient weighed at the beginning of treatment 158 pounds stripped, or 15 pounds less than usual. At the end of 21 days he weighed 140 pounds stripped. Height 5 feet, 11 inches. The first thing allowed was clear coffee. As this is a stimulant and not a food, it was thought its use would favor elimination. Then followed barley broth and oatmeal tea, because they contain little or no starch, and shortly the return was made to two meals a day. A gain in weight of two pounds a week followed. The bowels were allowed to regulate themselves. The desire for food promptly declined once the mind was made up to quit eating.

Usually, no such severe restrictions have to be resorted to. Often a diet, limited in the use of starches and sugars, is all that is required. Greater restriction than this would be represented by a small cup of clear coffee in the morning, a bowl of beef or mutton broth at noon (a pint) and a glass of milk and vichy or of barley broth or whey at night; this to be maintained for two or three weeks, when an increase in the amount of food, or a return to solid food, may be made and gradually carried up to the point where the system balances; that is, the patient feels well and remains cured. The specific gravity of the urine is evidence of the stage or condition of metabolism, and whether the system has cleared itself of morbid material. Usually it is high at the outset, but gradually declines to 1,010 or not much above that figure. Water for thirst is desirable and for purposes of elimination. The tongue is another indicator. A coated tongue declares a foul stomach. The secretions of the mouth

do not determine the condition of the tongue. This can be demonstrated by any one at any time who will undergo a ten days' fast. In that time the stomach will sweeten and the tongue become clean and moist. It will immediately become coated if food put into the stomach, at the expiration of a fast, disagrees. A foul tongue calls for a restricted diet. Skin diseases yield reluctantly to local treatment as long as the tongue remains coated.

When less food is required, if properly eaten, there is a vast amount of nervous force saved. The system, relieved of the necessity of ridding itself of quantities of food eaten but not required, saves an amount of energy possibly equal to that used by the brain in its daily round of work. The greater amount of mental vigor that follows the use of food, up to what is physiologically required, but not beyond it, is proof of the nervous force lost in this way. This extra strain of itself upon the machine must wear it out years ahead of its time. Man alone, of all the animals, lives less than five times his maturity. He lives longer than he used to, according to the statistics, but he suffers more from illnesses of the sort discussed in this paper. Sanitation and hygiene account for this increase in longevity, because by these means more children are saved to grow up. But with sickness in maturer life on the increase, there must be some great fundamental cause at work. Overeating may be that cause. It certainly has not been controlled. Overeating will rot the physical and moral fiber of a man, and why not of a nation? Lust for food satisfies only the baser instincts. It stimulates sensuality, the inferior passions and desires, and robs a man of his spirituality. The physiologic glutton is hardly spiritual. Animal force in a flight of oratory may win the applause of the multitude, but never the hearts of the people. A mind "crowned" with overeating may capture a city, but not the man at the head of the procession. If spirituality is one of the things needed in this world to offset its "splendid materialism" abstemiousness in eating is one way of gaining some of it. Plain living and high thinking work well under the same yoke. Perhaps the secret of longevity, sought for in fabled springs and patent elixirs, lies hidden in the proper utilization of our every day foods, in marriages founded on health as well as sentiment, coupled with moderation in all things. Nature's great law rules everything; it is the one law that cannot be broken with impunity without retribution. Man, alone of all that is, shows the least obedience and the least self-control.

Asks Control of Ambulances.—The transfer of the police ambulance used for the removal of sick and injured persons to the control of the city health department is asked by Commissioner Whalen of Chicago. He wishes a physician to be placed on each wagon to give most prompt attention to the injured. The city council probably will be asked to transfer the eight ambulances and place the appropriation under the health department.

TYPHOID FEVER: HOW CAN IT BE ELIMINATED?

BY

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There are four fundamental observations concerning typhoid fever which must be thoroughly understood before we are ready to discuss ways and means for its elimination.

(1) The specific cause of the disease. (2) The conditions which favor and those which hinder the rapid development of the specific bacillus. (3) The routes by which the infectious principle enters the body. (4) The various agencies which convey the specific infection to the ports of entry in the body.

(1) *Etiology*: There is no more interesting chapter in the history of medicine than that which traces the etiology of typhoid fever. It is very certain that Hippocrates described a fever with such clinical accuracy that it can be recognized today as none other than typhoid fever. The master minds in medicine in every capital in Europe contributed the results of their clinical observations and of their pathologic studies to the elucidation of the nature of abdominal fevers, and, in the beginning of the nineteenth century, discussed the possibility of there being two distinct diseases which were commonly considered as but variants of one.

Two American physicians, Drs. Gerhard and Pennock, of Philadelphia, demonstrated "The Distinctions between Typhus Fever and Dothienteritis" (typhoid) in 1836 with such clearness that their results were accepted and confirmed by physicians of Europe with the utmost cordiality. But at that date there was no accurate conception of the nature of the infection, its local habitat, or of the ways by which man contracted the disease, and the theories which were elaborated and maintained with great vigor were numerous and some of them most fantastic.

Budd, in 1856, published a paper in the London *Lancet* on "Intestinal Fever: Its Mode of Propagation," which is remarkable for its accuracy and its insight. His conclusions were, "typhoid fever cannot develop spontaneously; every case originates immediately from some antecedent case. The typhoid poison is generated by the patient himself, it adheres especially to the stools with which it is evacuated." He ends by stating that it would be possible wholly to eradicate the disease if means could be devised capable of rendering the infectious stools innocuous. This was in 1856, long before the use of the compound microscope by scientists and when there were the vaguest notions, rarely expressed, that there might be specific living entities that caused the various diseases known to be contagious or infectious. It is another instance of the anticipation of modern demonstrations in the laboratory, by careful clinical observations. Dr. Budd's series of articles focused the attention of the medical scientists of the world, and his observations

made easier the path of those who followed him with microscope and culture tube.

Just 25 years ago Eberth discovered the bacillus which is definitely recognized at the present day as the specific cause of typhoid fever. His observations were repeated and confirmed in every medical center on the globe. Today, through the labors of Eberth, Gaffky and many others, we have a definite knowledge of the morphology of the bacillus, its action both in the body and outside of it, and its distribution in the tissues. Its presence has been demonstrated in the feces, in the blood, in the spleen, in the roseolar eruption of the skin, in the urine, and, in those rare cases of pneumotypoid, in the sputum.

We define typhoid fever now as "a general infection caused by *Bacillus typhosus*" (Osler).

(2) *The conditions which favor and those which hinder the rapid development of the specific bacillus:* This bacillus develops most rapidly at the normal temperature of the body, but it develops rapidly and abundantly at the ordinary room temperature. It has greater energy and develops in greater abundance when exposed to air, but it maintains its life and develops freely when excluded from air, if temperature conditions are favorable. Heat destroys the bacilli. A temperature of 167° F. kills them in from 10 to 15 minutes, and higher degrees of temperature are more rapidly fatal. Cold does not destroy them, though it stops their development. In a paper read by Dr. H. C. Hutchings before the Syracuse Academy of Medicine, December, 1902, he demonstrated that an outbreak of typhoid in the Hospital for the Insane at Ogdensburg was due to the use of infected ice which had been stored nine months. He was able to isolate and grow the bacilli recovered from the water obtained by melting the ice. I believe this is the longest period of vitality of the bacillus in ice which has been reported.

The direct rays of the sun, giving a combination of heat and light, rapidly destroy the bacillus, but the diffuse light of an ordinary room has but little modifying influence on its vitality or energy.

Drying does not kill the bacilli, but it does prevent their multiplication. Infected dust, dried secretions on utensils, sand, and garden soil have yielded living bacilli full of energy after many months of rest in these conditions.

In water they maintain vitality for a long time, and the freer the water is from water bacteria, the longer they maintain their vitality. Even carbonating water does not destroy them.

In many foodstuffs they live and grow abundantly. Bouillon, milk, potato, gelatin and saccharin foods afford them abundant nourishment and they grow luxuriantly in them.

The living bacillus has been found in the pus of an abscess years after the patient had recovered from the

fever. It has been found in the fecal discharges three months after the symptoms of the disease had entirely disappeared. In dried feces it has a longer vitality, and there is no definite knowledge as to how long it may remain vital in dried stools deposited in garden soil. The living bacilli were recovered from an infected stool left in a cement vault four hundred days after the stool was deposited.

Besides heat, certain chemical substances rapidly destroy the bacillus. Their number is large, but for practical use we may consider only chlorinated lime, and freshly prepared milk of lime. Chlorinated lime is effective in disinfecting the stools and the urine. Milk of lime is not effective in disinfecting the urine. Formaldehyd is an ideal germicide, but is very expensive for use in this disease. It is the best substance, however, for infected sputum. It is best to know thoroughly how to use one disinfectant that is easy to get anywhere. Chlorinated lime put up in pasteboard boxes which have been coated with resin is always reliable.

(3) *Routes by which the infectious principle enters the body:* After laborious investigations it is now generally conceded that the selected route, and, practically, the only route by which the specific bacillus gains access to the human body, is through the digestive tract. The specific bacillus may be introduced through food or drink, or may gain access to the oral cavity in dust, but it is swallowed, it is not influenced by the secretions of the stomach and begins its active work in the intestines, selecting as its favorite domicile the glandular masses in the small intestines. Thence it gains access to the bloodstream and through it is disseminated to various organs, and manifests its activities in one or the other, according to the peculiarities of the susceptible individual.

In the comparatively rare cases of pneumotypoid, it is a question whether the infection is due to the direct inhalation of infected dust into the lungs, or is accomplished by a circuitous route. In the cases of this manifestation of the disease which I have observed the patients have recovered, consequently no facts to confirm or deny the possibility of direct infection are at my disposal. In cases in which gross intestinal lesions have not been observed after death, and in which it has been predicated that the infection may have been through the respiratory tract, or even through the intestinal membrane without lesion, it has been stated that many fatal cases show such indefinite intestinal lesions to the unaided eye that it is not fair to assert, without microscopic proof, that there was not a primary intestinal lesion. This is of practical importance because it simplifies the problem if it can be safely held that only the feces and the urine in the vast majority of cases convey the bacilli from the infected individual.

(4) *The various agencies which convey the specific infection to the susceptible subject:* If we admit that

in the vast majority of cases, if not in all, the infection is carried out of the body by the dejections, it follows that only those things which are soiled by the stools or the urine are capable of conveying the bacilli to man. This opens up a very wide field for observation. In caring for the dejections, the body and bed linen, the hands of the attendant, the floor, the utensils, the remnants of food, etc., may be soiled.

If the stools are thrown into the water closet without previous disinfection and without sufficient care, the closet itself, and the stream or cesspool into which it drains becomes infected. If they are thrown into a privy vault, such a vault is infected, and drainage from it can infect the surrounding soil and nearby sources of water supply. In an epidemic at Charlotte the infection was traced to a well 100 feet from a privy into which typhoid dejections had been thrown, and it was experimentally demonstrated by certain color tests that there was drainage from the privy to the well, through 100 feet of clean lake sand. If they are buried in the earth without effective disinfection the soil is contaminated and the bacilli may be conveyed thence by water, or brought to the surface by the agency of worms, and thence be blown about as dust, which, lodging on favorable mediums, may infect articles of food or drink, or may be conveyed directly to the oral cavity of individuals.

The most frequent carrier of the infection is unquestionably water. This may be effective when used as drinking water, or for sprinkling or washing vegetables and fruits which are usually eaten raw, or when used for washing utensils in which milk or any fluid food is put, or when used as a diluent for fluid foods or drinks. It is unnecessary to recite instances to illustrate each one of these examples. They are too familiar to you and require no bolstering up by collated observations.

Next to water I should place infected dust. I quite agree with Dr. Veeder, of Lyons, in his observations on the role of dust in the propagation of typhoid. In the country districts in particular it has been customary to bury the stools in a trench in the garden. The stools from a single case of typhoid thus disposed of without previous disinfection contain an incalculable number of bacilli, which we have seen are capable of maintaining their vitality and of even multiplying in warm weather. The worms and insects of garden soil work this to the surface and then, upon drying, it can be blown about and can infect man directly by his receiving it into his oral cavity, or indirectly by contaminating the great variety of food substances upon which this bacillus thrives vigorously.

Next to dust, and closely related to it, is the common house fly. As a boy I used to hear it said that "the fly is the common scavenger of man." It may be so, but the fly has peculiar tastes, and very bad manners. In the Spanish-American war, the medical records of which show that 85% of the fatalities were due to disease, and

of these a very large proportion were due to typhoid, an eye-witness told me that the flies from the sinks visited the tables during meals and, footing it over food, left their traces with the lime dust which was used in the sinks. The same thing was observed in the Anglo-Boer war.

The house fly is ubiquitous. It is more fond of a sickroom than a trained nurse. It puts its foot in where doctors fear to look. It is indiscriminating, and transfers its attentions from excrement to dainty food as a matter of habit. It is one of the common conveyers of the infection directly from excrement to food, and of infected dust to food.

After what has been said it is hardly necessary to speak of food as a direct carrier of infection. The food must be first infected, and such infection may come through water with which it has been washed or diluted, through infected dust, and through the agency of flies. Certain sea foods which are eaten raw, like oysters and clams, have been the carriers of typhoid infection. It is the custom of dealers in seacoast towns to keep their bivalves in baskets suspended from piers, and from these to supply their customers. In many instances these baskets have been found to be suspended over the mouths of sewers whose discharges contained the dejecta of typhoid fever. The beds themselves have been found to be washed with sewage from outlets to sewer systems of nearby towns.

Household articles which have been carelessly contaminated may be the conveyers of the contagium. This is particularly true of clothing, dishes, and things carelessly handled by an inexperienced attendant. The dried excretions on any of these articles become broken up and contribute a part of the dust of such a room or house, and this is a potent agency for the transmission of the disease.

From what has been said, it follows that in the homes of the slovenly and the ignorant the chance for contagion is very much greater than in those of the cleanly and the well-informed. But age, climate, and social conditions of themselves do not confer immunity. It is the common observation that the victims of this disease are recruited from the ranks of the strong and the active workers of the world, and because thus far these are mostly men, males are more frequently the victims of the disease.

We have now the necessary preliminaries before us, and are prepared to discuss the means at our command for eliminating typhoid fever. A very brief sentence states the whole case to an audience such as this, viz.: Disinfect every discharge from the bowels and the bladder in every case of typhoid. If this were done it would not be long before all the typhoid bacilli now existing in water, ice, and soil, and wherever else they may be, would be destroyed by self-limitation. True, until that time was complete, we would have cases and epidemics

of the disease, but if there were no addition to the present stock of this bacillus on the earth because every typhoid discharge from this moment would be effectively disinfected before being disposed of, the disease would disappear in a little more than one year!

What an ideal condition to contemplate! The requirements are so very simple—just the disinfection of the discharges before disposal! And then—no more death from typhoid! But does any one dream that this will happen?

A century ago Jenner demonstrated that effective vaccination made smallpox impossible. But smallpox is epidemic today in our own country! We know that there is no disease so accurately limited by strict quarantine as scarlet fever, but scarlet fever, like the poor, is always with us. We come back to those inherent traits of human character—ignorance, prejudice, neglect, carelessness. And to them, we, in this “land of the free,” must add want of respect for authority. We have accented the word “free” so many years that it is ingrained in the fiber of most Americans that every one is free to do as he pleases, whether his pleasure is based on sound reasoning or not. That was the trouble with our volunteer forces in the Spanish-American war. The average volunteer had no conception of the meaning of the word “obedience.” Read the records of the government recently published on typhoid fever in that war, and see to what it led. Of the deaths 85 % were due to disease which was preventable!

The Japanese Baron, Kentaro Kaenko, recently told me that six years or more before war was declared against Russia, the Japanese government sent medical officers expert in bacteriology through Manchuria and all the anticipated seat of war, who examined the water in every stream and lake, and spring and well, and filed reports as to its potability, and that in the field medical officers are sent in advance of the army who reexamine every possible source of water supply and label them plainly, indicating of what sources it is safe to drink, and what must not be used. The medical history of the Japanese army in the present war will tell a story of gain in life from obedience to sanitary laws that the world has never seen, and, if reports already in are confirmed, far beyond the dream of the most sanguine devotee of Hygeia. It is a most hopeful augury of the future to observe that the latest nation to accept the science of the western world has demonstrated in practice the wisdom of the conclusions so familiar to us all. When the so-called civilized nations live up to the advanced knowledge of their experts in bacteriology and in preventive medicine, we may confidently expect the dawning of that day when typhoid fever shall be known only in history. Until then, and it is a long and weary road, we must preach and teach and legislate, and be instant in season and out of season, to indicate to the people what to do in every condition of life. We must

warn them that the great water systems of the land are contaminated, that the majestic St. Lawrence and the beautiful Adirondack lakes are infected, that every country well is under suspicion, that water from these sources must always be boiled before using, and that even the water supplies planned for the protection of the people in cities must be constantly policed and inspected to insure a tolerable degree of purity. We must insist upon care and scrupulous cleanliness in the sick room, and teach nurses and many doctors, too, that effective disinfection is not accomplished by a dash of carbolic acid or of some evil smelling “ready-to-sell” so-called disinfectant, but is accurately and reliably accomplished by a pint of fresh chlorinated lime solution, $\frac{1}{4}$ pound to the gallon of water, intimately mixed with the dejections and left to stand one hour before emptying. The futile notion still prevalent in many communities that a substance of peculiar and stronger odor than the unpleasant one of fecal discharges does anything more than to change the smell must be diligently combated. The use of heat by boiling all clothes and dishes and all exposed articles looks too simple a process for many minds. We must teach that it is the only one that never fails, and reiterate it until it becomes believed.

We must insist upon the exclusion of flies from the sick room and from the place where the stools stand until they are disposed of. On account of the difficulty of doing this satisfactorily, we should see that nurses, or attendants, cover all dejections upon removal from the bed, and keep them covered after the chlorinated lime is admixed and until it has accomplished its purpose. We must not weary in telling the same old story time and time again. We are advancing. Since Eberth's discovery of the specific bacillus we have done much to limit the dissemination of typhoid, and some time, when, we cannot say, typhoid fever will be exterminated from the earth.

ABSCESS OF ANTRUM CAUSING SYMPTOMS OF ACUTE ARTICULAR RHEUMATISM.

BY

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CASE.—The patient is Mrs. G. W. H., aged 32, of Ashley, Ind.; before January, 1904, she lived temporarily in Dallas, Tex. She has two children, and is a healthy woman. In January, 1904, she had a “cold in the head” and for two days her “head was stopped up.” She consulted a physician, who prescribed a douche, and she received some relief from this treatment. The cold was followed by general symptoms of grip. She now consulted a specialist, who ordered the douching continued. There was a free discharge of pus, yet she had much pain over the right side of the face and forehead. While in this condition she came north to her home and I was consulted. On examination I found pus in the middle meatus at the anterior border of the

middle turbinate. There is also an exostosis of the bony septum at the juncture with the nasal bone and the quadrilateral cartilage. This growth crowded over against the anterior end of the middle turbinate in such a manner as to make the bulla ethmoidalis and hiatus semilunaris invisible. At this point a collection of pus was found. Cocain and adrenalin being applied, the slit was opened and the pus oozed slowly out.

Since coming under my observation, about May 16, the patient has had daily headache limited to the right brow, and pain in the right eyeball, which was referred to the orbit and over the cheek.

When exposed to cold air, as in the winter, the pain in the cheek would be much aggravated; or if she took fresh cold the face pain became more pronounced. Even putting the hands in cold water started pain in the face. Ordinarily the pain is confined to the right brow; it begins upon arising in the morning and grows more severe as the day advances. Stooping forward or hanging the head aggravates the pain.

Treatment has been directed to securing free drainage of the frontal sinus, as it was believed this cavity was at fault. Flushing the sinus with a cannula did not relieve the feeling of uneasiness about the head. In fact, the apparent closure of the slit leading from the frontal sinus into the middle meatus made it quite difficult to determine whether the pus flowed from the antrum or frontal sinus. During the last three weeks, the patient has lost weight and she seems to be in a much run down condition.

On May 24, following a flushing of the frontal sinus on May 23, she had a severe chill followed by fever and was confined to her bed for 24 hours. On May 26 she had severe pain in the right knee-joint, left elbow and shoulder. This pain and tenderness lasted for about 48 hours. The second day following this chill, when at my office, her temperature was 100°. As she is a very nervous woman and sensitive to pain, I determined to exclude the antrum by the exploratory probe puncture method, which consists in passing a sharp trocar through the thin partition wall between the antrum and inferior nasal meatus. The parts are cocainized with a cocain solution (8%) and the point of the trocar is set against the central wall at the anterior end of the inferior turbinate. By firm steady pressure the antrum is entered; the sharp point of the instrument, standing when in position in the antrum at an angle of 45° to the antero-posterior axis of the nose, 15° above the horizontal plane of the floor of the inferior meatus. To the free end of the trocar is attached a small rubber tube, 8 to 10 inches in length. Into this tube is inserted the nozzle of a syringe, and sterile water is passed through the antrum. If there is any pus in the cavity of the antrum it will be carried out through the ostium maxillare, into the middle meatus and into a pan held beneath the nose.

In the case of my patient, at least two teaspoonfuls of thick pus was carried out into the pan, demonstrating to my satisfaction, that the antrum at least was involved in the process of pus retention. It now remained to discover whether the antrum alone was involved and whether it was primarily or secondarily affected. After passing a stream of water several times through the antrum, and lastly, forcing the air through to expel all fluid, I had my patient lie down on her left side, with the head falling forward and dependent below the vertical axis of the body. After lying in this position for ten minutes, the nose was again inspected and no pus was found, at the point where it was observed before. This

proceeding applies to cases in which the pus is fluid and of thin consistency. A thick gelatinous substance would not flow out and it could only make its escape under pressure of overdistention. I suspected this to be the condition of the contents of the antrum in my patient, as the substance washed out was quite thick and its over-accumulation would explain the severe paroxysm of pain experienced at the time of her having the chill with subsequent increase of temperature and sweating, together with painful joints, as mentioned.

Following the exploratory puncture, which was done on May 30, the pain was not so great, but on leaning forward she still had pain in her right brow. Examination of the nose showed the middle meatus free from pus for the first time since I saw her. The slit between the septum and outer nasal wall has more space.

On May 31, the nose was again examined and only a trace of pus was visible. Another probe puncture was made on May 31, and a teaspoonful of pus washed out, boric acid solution (4%) being used. The pus was examined by Dr. Wallace, who found pneumococci.

The question of disease or infection of the accessory sinuses of the nose is most interesting both from the point of surgical therapeutics and as the frequent cause of serious central infections, general sepsis, and chronic neuralgia. It would far transgress the limits of this paper if more than the most casual glance were given to the anatomy of the accessory sinuses alone, to say nothing of the many general infections which may find a beginning in the various sinuses. The antrum stands in such relation to the roots of the teeth that dental caries may be the beginning and frequently is the sole cause of the infection of the antrum. The roots of the teeth may penetrate the antrum and stand exposed in the cavity. Abscess of the roots or their surrounding alveoli may break into the antrum and thus originate an antral abscess. As medical men, we find infections from pneumonia, diphtheria, typhoid fever, grip, scarlet fever, and in fact any of the exanthematous or contagious diseases as causative factors in the production of abscesses of the accessory sinuses.

Many a patient has succumbed to cerebral abscess, from infection of the frontal or sphenoidal sinus following pneumonia or influenza, when the real cause of the severe pain of the head was not suspected. Many a death could have been prevented by timely operation upon the sinus, neglect of which permitted direct infection by the discharge of the abscess into the cranial cavity or indirect infection through the lymphatic circulation of the brain. We cannot ignore the accessory sinuses in the causal relations to general sepsis when we so clearly recognize the middle ear and mastoid cells as being capable of disease sufficient to destroy life by temporarily harboring the deadly microorganisms, from which acute meningitis, abscess of the brain and phlebotrombosis may arise. Because the accessory sinuses are closed to ordinary inspection and because the symptoms and signs arising from the retained pus are not such that he who runs may read, are not sufficient reasons for neglecting to explore these cavities, both by the

mechanical technic which is at our disposal, as well as by the deductive method afforded by the poisonous character of microorganic life concealed in closed cavities and only awaiting a favorable moment for transportation to a vulnerable and vital tissue of the body.

We know the relation which gonococci sustain to the general infections of the host who harbors them; we inquire into the condition of the genitourinary tract in iritis and must reckon with such infection in many septic conditions.

The great size of the antrum and its susceptibility to direct infection from the nose makes its anatomic consideration of much importance. Its floor is formed by the roof of the mouth and alveolar arch as far forward as the first bicuspid tooth; the floor of the nostril stands over the alveolar arch of the incisors and canine teeth; the partition between the inferior meatus of the nostril and the inner wall of the antrum, is partly bone and partly membranocartilage: there is an opening of variable size between the middle meatus and antrum, known as the ostium maxillare. This opening may be a slit or it may amount to a small foramen. It is situated at the top of the hiatus semilunaris, and is generally on a lower level than the bulla ethmoidalis, which is situated just opposite the anterior end of the middle turbinate. Extending upward from the hiatus semilunaris, and, in fact, forming its continuation as a sulcus, is the infundibulum leading into the anterior ethmoidal cells and onward into the frontal sinus. It is thus clear that the antrum stands in a position of peculiar susceptibility to either primary infection from direct extension of the infective process from the nose or secondary infection from the draining of the infective material, either from the frontal sinus or anterior ethmoidal cells.

These infections may also arise from infectious material carried in the blood current, as in typhoid or cerebrospinal meningitis. These cases and their infectious origin have been so thoroughly studied by Fränkel, Friedländer, Weichselbaum, Garel, Lindenthal and others, that no possible doubt can exist as to the pathology.

I am convinced that cases of facial erysipelas which I have seen have arisen from the nose, with the focal point in the sinuses. Suppuration of the sinus has been ascribed to nasal polypi. My belief is that nasal polypi are purely secondary to the irritation arising from the flow of pus or carious bone.

Kiaer and Lapalle made postmortem examinations to determine the frequency of pus collection in the accessory sinuses. Death was from various causes in 195 autopsies, and in 88 instances pus was found in the accessory sinuses. The maxillary sinus was most frequently involved, the sphenoidal next, then the ethmoidal, and the frontal least frequently.

Lapalle's observations were based upon 169 autopsies, in which 55 showed sinus involvement. In order of fre-

quency the antrum was first and the sphenoidal second. Accumulated evidence supports the contention that chronic suppuration of an individual sinus is rare. The antrum may be diseased alone and the sphenoidal sinuses may be alone affected.

The diagnosis of latent empyema so called, or chronic suppuration of the accessory sinuses:—Pus may be secreted for months and even years from one of the accessory sinuses without acute symptoms being shown. I have treated a patient for suppuration of the anterior ethmoidal cells for four years by lavage and removal of polypi with no other symptoms than a slight sweetish odorous discharge. Radical operative treatment has been suggested and acquiesced in, but has not yet been done.¹

Diagnosis is by no means easy when one or more cavities are involved and repeated observations are necessary before one can correctly locate the diseased sinus. In my case just mentioned, a competent dentist treated the patient for antral disease, for several months before he effected a cure. The antrum had apparently remained cured, but this was only the seat of secondary infection, the ethmoidal cells being the seat of primary infection or what is also possible, the flushing of the antrum may have carried infection through the ostium maxillare, through the hiatus semilunaris to the anterior ethmoidal cells. Hence it is always desirable to flush the antrum very carefully and without the head too low for fear of carrying the pus into the adjacent cells.

Nasal Discharge.—This may be the chief and only complaint of the patient. The date of origin may be obscure, the patient complains of a chronic cold in the head which has lasted for months or years. In some cases the discharge may be purulent and in others stringy, owing to admixture with mucus. Characteristics of the discharge have no localizing value. Hajek thinks the tendency of pus to dry into small crusts indicates ethmoidal disease, while Killian attributes the same characteristics to sphenoidal disease. I would suggest that the formation of small crusts means slight discharge with large and free contact with the air, by reason of which the pus is desiccated more rapidly. A bad odor which is noticed by the patient generally indicates antral disease. Such patients do not have a foul breath as noticed by others; on the other hand, in atrophic rhinitis the patient's sense of smell is destroyed, but the odor to others is very pronounced. Bilateral nasal discharge does not mean sinus affection on both sides. Both frontal sinuses may be affected, while the pus discharges from but one nostril. The flow of the pus may be intermittent, becoming worse when the patient stoops. Pus flowing into the pharynx would indicate the sphenoidal and posterior ethmoidal cells as at fault, when from the frontal sinus it discharges into the front of the nose.

Pain is a variable symptom and may be entirely ab-

¹Since submitting this manuscript the patient has been operated externally through frontal sinus and cured.

sent. It may be in the nature of a headache, facial neuralgia or toothache, which is paroxysmal or constant. It may be confined to one brow and aggravated by stooping as in the case reported. There may be inability to concentrate the mind for any length of time, while mental work induces headache. Pain is only a symptom, the origin of which is irritation of the fifth nerve in some of its ramifications. Tenderness upon pressure over the floor of the frontal sinus or nasal bones has clinical value as pointing to disease of the frontal sinus and ethmoidal cells respectively. Cough, dryness of the throat and huskiness of the voice may be complained of, while true asthmatic symptoms are often encountered.

Eye Symptoms.—The anatomic relation of the nasal accessory sinuses to the orbit and to the middle cranial fossa is sufficiently close to explain many ocular phenomena arising from diseases of the various sinuses.

Two general classes of eye symptoms follow abscess of the accessory cells: (1) Displacement of the eyeball in abscess of the ethmoidal, sphenoidal and antral sinus. (2) Those which depend upon compression or destruction of the optic or oculomotor nerves. The latter is more commonly met in abscess of the sphenoidal sinus. Abscess of the antrum causing displacement of the eyeball is met much less frequently than displacement from ethmoidal and sphenoidal abscess. In frontal sinus abscess, even though we do not have an associated orbital abscess, there may be displacement of the eyeball downward and outward. A similar displacement may occur in ethmoidal abscess. Primary orbital abscess is not common and its presence should lead to the examination of the accessory sinuses. Neuritis with associated atrophy of the optic nerve should lead us to examine the nasal cavity, and when there is likewise paralysis of some of the motor oculi nerves in conjunction with the neuritis it is very suggestive of sphenoidal sinus abscess.

No conclusion should be reached without due consideration of the testimony presented by the examination of the nasal cavities. This is the more necessary when we remember that many of the nasal phenomena described may be induced by lesions confined to the nasal accessory cavities themselves, resulting from such causes as the exanthems, syphilis, atrophic rhinitis, malignant disease, foreign bodies and nasopharyngeal catarrh.

Country Doctors May Strike.—Tired of working for the miserly payment which the State allows them, the Austrian country doctors are preparing to strike. No longer, they say, will they vaccinate the poor for twopence a head, when veterinary surgeons get four times that sum for inoculating cattle against disease. Neither will they go on examining tramps and vagrants at a rate which pays a qualified doctor less for overhauling a roving vagabond than the barber gets for cutting the hair of the same individual. Unless the government promptly increases the whole scale of payment for public medical attendance, the country practitioners declare that they will cease work except in cases of extreme peril.

DIGEST OF MEDICAL LITERATURE

CLINICAL MEDICINE.

DAVID RIESMAN
NORMAN B. GWYN

A. O. J. KELLY
BERNARD KOHN

HELEN MURPHY

MILK, FROM A SANITARY STANDPOINT.

BY

A. H. STEWART, M.D.

During the year 1905 many articles have been published dealing with the milk question. The popular interest has been awakened by the newspapers. The daily papers, the farm and dairy journals, and the medical journals have opened their columns to those who are demanding clean, pure milk. The United States Government, through the dairy division of the Agricultural Department, is sending abroad, for the asking, most valuable information. The State experimental stations are studying the local conditions in the various States and giving valuable aid to the producers of milk.

The State Boards of Health are using every effort to stop adulteration of milk. The city Boards of Health are working for clean milk and are making most stringent regulations to prevent the conveying of contagion through milk.

The agitation for clean milk, begun a few years ago by the physicians who were interested in infant feeding, has spread, and the people are no longer satisfied with inferior milk. The dealers in milk, to meet this demand on the part of the people, are using every effort and spending vast sums to keep milk marketable until sold.

Philanthropists are establishing dairies and equipping them with the latest improved machinery for the production of clean milk under the most approved sanitary conditions. Others are attempting to furnish clean, healthful milk to the poor children of our large cities without charge. The more advanced are clamoring for municipal ownership of dairies and the municipal control of distributing stations for prepared milk for infant feeding, to prevent the high mortality in children.

The effort to have passed more stringent regulations and laws governing the production and sale of milk for the protection of the masses against milk-borne diseases is meeting with favor even from the producers of milk. The price of milk has advanced, and when it is generally recognized by the people that the clean milk that they demand cannot be produced profitably to anyone at the old price for dirty milk, the advanced price for the new food, "clean milk," will be given cheerfully.

The sale of milk hundreds of miles from the source of supply has necessitated new and expensive apparatus and much more care to prevent contamination during the collection, refrigerator cars for shipment, and cold storage and other expensive apparatus for the preservation of milk until sold. Pasteurization of the general milk supply has received much attention from the various investigators at home and abroad, and their opinions concerning its proper value are given in detail.

The use of the patent milkers, a number of different designs now being in use, may do much toward solving

the labor question involved in the production of milk, which has always been a most troublesome one from both an economic and a sanitary standpoint.

The proof of the carrying of contagion by milk is convincing and can no longer be set aside.

The prevention of tuberculosis in cattle has not been attained, but during the year great strides have been made, and it is hoped that before another year science may celebrate a victory over this scourge of cattle.

The bacteriology of milk has received great attention during this year, and numerous articles, many of great value, have been published, a few of which are abstracted.

Saccharomyces in Cow's Milk and Their Bacteriologic Activity.—F. Valgussa and G. Mafera (*Rivista di Clinica Pediatrica*, September, 1905) have examined commercial samples of milk with regard to the changes in the milk as a result of the activity of saccharomyces, with a view to producing a new form of artificial milk suitable to the infant. They were found in all the samples of milk examined with either neutral or acid reaction, especially when pronouncedly acid. These germs as found in milk vary with the condition and state of preservation of the fluid. Certain germs belonging to the alcoholic ferments are constantly found. When lactic acid fermentation ceases, the germs continue to live on the albumins, fats, and secondary products. In certain conditions the saccharomyces prevent the action of parasitic germs on the albumins; some coagulate the casein directly, independent of acid reaction, by the action of a ferment analogous to the lab ferment, and produce a fine precipitate of casein; others segregate the ferments, and give unusually active enzymes of amylolytic power, lactases, glucases, lipases, proteolytic ferments, and probably caseases. Oxidizing ferments and salol ferment are unchanged; some of the alcoholic ferments produce a strong odor in the milk. By the action of saccharomyces it is possible to modify milk in its chemical and physical characteristics and its action toward ferments even when the milk has been sterilized.

Use and Abuse of Condensed Milk and Patent Foods in Infant Feeding.—G. F. Still (*The Practitioner*, October, 1905) considers the various preparations as condensed milk, Allenbury's food, Horlick's, Mellin's, Carnrick's, and several less wellknown foods, and from this draws general conclusions. A point made emphatic is that the suitability of a particular food for prolonged use is not proved by the mere fact that it is taken well and produces no immediate ill-effects. Trade preparations are deficient in fat, and in comparison of trade foods with human or cow's milk percentage composition is an incomplete and possibly misleading description. These foods, however, are useful under certain conditions. One hears of infants "who could not take cow's milk," improving at once upon condensed milk; if this milk had been stopped after two or three weeks no harm would have been done, but it is continued for as many months and the children often get rickets. That patent foods should best be used temporarily is not sufficiently understood by the laity and is not emphasized by physicians; upon the latter rests no small responsibility for the abuse of infant foods by lay people. In conclusion, Still says the more the medical man knows of the many simple methods of adapting fresh milk to the needs of infants the less use he will find for condensed milk and patent foods. [A.G.E.]

Methods Employed in the Examination of Milk by City Health Authorities.—A. H. Stewart (*American Medicine*, March 25, 1905) stated that the enforcement of the law concerning the amount of butter fat and the percent of solids not fat that milk should contain, has led milk producers to believe that if the milk contained the required amount of fat and of the solids not

fat, that their duty to the consumer and their legal responsibility ended. But the epidemics of various kinds—typhoid fever, measles, scarlatina, etc.—which have occurred almost every year in this country and abroad, and which have been spread by infected milk, have taught us that more care must be employed in the supervision of the milk traffic. In 1904 only 0.82% of the samples of milk collected in Philadelphia was found to be watered. A qualitative and quantitative method of examination of milk for pus cells and bacteria is described in detail, with a description of a special lactocrit of a very high speed, which permits of rapid examination of large numbers of samples of milk by a single operator daily.

The following tabulated reports are taken from the yearly report of the milk work done in the laboratory, showing the number of samples of milk examined bacteriologically and condemned during 1904:

Month	Number of samples	Number condemned	Pus	Pus and pus organisms	Pus organisms
January	580	151	53	56	42
February	590	147	38	69	32
March	461	177	25	34	118
April	864	135	48	72	15
May	719	77	15	57	5
June	763	36	11	24	1
July	818	196	14	164	18
August	838	102	6	91	5
September	741	72	28	38	6
October	1,028	46	23	22	1
November	1,161	41	27	6	8
December	819	49	6	40	3
Total	9,821	1,219	292	673	254

REPORTS OF THE VETERINARIANS SENT TO INSPECT THE HERDS.

Conditions and diseases reported.	Number of reports received from veterinarians.
Mammitis { Garget Inflamed nipples Edema of udder Bruised udder }	383
Septicemia	1
Pustular dermatitis	5
Cowpox	4
Parturient paresis	1
Milking too close to parturition	17
Out of condition	2
No disease could be detected	413
	108
	516

The later reports received by the chief milk inspector from the veterinarians, called to inspect the herds when milk has been condemned, are as follow: Percent of inspection in which disease was found when milk was condemned because it contained pus, 97.1. Percent of inspection in which disease was found when milk was condemned because it contained pus-producing organisms, 74.8. Percent of inspections in which disease was found when milk contained both pus and pus-producing organisms, 90.3.

A Single Service Paper Milk Bottle.—A. H. Stewart, of Philadelphia, (*Sanitation*, December 6, 1905), recommends the use of a single service paper milk bottle instead of the ordinary glass receptacle generally used in the United States. The objections to the glass bottles are the original expense of the bottles, the breakage, the difficulty in cleaning, the expense of collection of empty bottles, and the danger of transmission of infectious diseases through their use. The paper milk bottles recommended are made in the ordinary sizes and are conical in shape to facilitate nesting. The bottle is saturated with paraffin which strengthens it, sterilizes the paper and prevents the taste of the paper being taken up by the milk. The bacteriologic tests made comparing the paper bottle with the glass bottle were decidedly in favor of the paper bottle. The price of the paper bottle is sufficiently low as not to increase the present general delivery price of milk.

The Influence of Infected Milk in the Diet of the Sick.—David E. Edsall, Philadelphia (Pediatrics, New York, Vol. xvii, 562-578), states the profession is alive to the fact that tuberculosis, typhoid fever, diphtheria, and a number of other infectious diseases (probably most of those that are of bacterial origin and perhaps some that are parasitic) may be transmitted in milk, and some of these diseases certainly have been frequently transmitted in this way. The milk supply in the wards of the Episcopal Hospital, of Philadelphia, which was examined most carefully by Dr. Ghiskey, was shown to be of very poor quality, and many of the typhoid cases fed upon this milk showed persistent and dangerous diarrhea with colicky pains, distention of the abdomen with nausea, and finally seven cases with severe or moderate intestinal hemorrhages. The milk was pasteurized and the diarrheas disappeared. The author emphasizes the fact that a high-class milk, requiring no pasteurization, is as necessary for patients, ill with the acute infectious diseases as for nursing children.

A Study of the Milk Supply of New York.—S. W. S. Toms (New York Medical Journal, 1905, v, 336-344) says the average quantity of milk consumed per capita in the United States is over one-half pint per diem, and it ranks third as the most common article of food or drink, only being exceeded by bread and water. Our water-supply is safeguarded by the most stringent laws, which local and State Boards of Health enforce most energetically, while public sentiment tolerates the pollution by disease-bearing germs of the milk supply. The cases of ice cream, cheese, and milk poisoning, and the high mortality of bottlefed infants, are in a large part due to the poisons formed by the putrefactive change that takes place in milk that is produced by careless and filthy methods of handling. The conditions in the dairies need radical changes to produce healthful milk. Regulations should be made at once with the cooperation of the various health boards to instruct dairymen in the production of good salable milk. The licensing of venders, and the requiring them to sign a contract to see that the milk producers live up to the health board's regulations governing the production and sale of milk, are strongly recommended.

Municipal Milk Inspection.—Wm. D. Green (Jour. Med. Soc. New Jersey, Newark, 1905-6, Vol. i, 315-318) advocates the licensing of milkmen, with a penalty for disobeying the rules of the Paterson (New Jersey) Health Board. These rules in brief are as follows: No milk shall be delivered from cows that are unhealthy; immediate report must be made to the Board of Health concerning any contagious disease that appears in the family or among the employes of the owner of the dairy. The utensils for handling milk must be clean. In delivering milk to houses in which there is a communicable disease, the milk must be poured into a vessel furnished by the family, the transfer of milk being done in such a manner as to avoid the handling of the family receptacle by the vender or the transmission of contagion to his hands or utensils. No milk tickets shall be collected from premises upon which there is contagious disease.

The Necessity for Live Milk as Exemplified by the Presence of Enzymes and Their Value in Digestion.—Louis Foster (Dietet. and Hyg. Gazette, N. Y., 1905, xxi, 529-532) states the cells in milk, with the exception of the fat globules are living cells and they retain their vitality for a considerable time after milk is drawn from the mammary glands. The chemical result of boiling milk is to kill the living cells and to coagulate all albuminoid constituents. The enzymes or ferments found in milk originate in the organic cells and are necessary to govern the equilibrium of the protoplasm. These enzymes are destroyed by prolonged pasteurization at 160° F. The sterilization of milk causes the coagulation of milk albumin and renders the milk more difficult to digest. Sterilization interferes with coagulability of milk by rennet, and with

its digestibility by gastric juice. Free fat as found in sterilized milk is probably not readily assimilated in infant food. The free fat being inclosed in a less easily destructible envelope is probable slow of digestion. Children fed on sterilized or boiled milk develop scurvy. This is due, according to Rundlett, to the vital changes that take place, not in albumen, fat nor sugar but in the albuminate of iron phosphates and possibly in the flourim. These albuminoids are certainly in the milk, derived as it is from the tissues that contain them present in a vitalized form as proteids. Constipation of the most stubborn kind will be encountered in all children fed on sterilized milk. Fayal says that the density of milk is increased by boiling above that suitable for infant digestion. The toxin of the colon bacillus, an organism quite common in milk, may be heated to 180° F., for a half hour without having its poisonous properties diminished.

Some Aspects of the Pure Milk Problem from Within.—C. W. Sorenson (Journal Royal Sanitary Institute, London, 1905, xxvi) discusses the obstacles that stand in the way of anything like a general progress toward the ideal of a pure milk supply. The ideal pure milk supply would be to have milk uncooked, free from disease germs and dirt, and undrugged with chemical preservatives. These conditions involve clean, healthy cows, grass-fed in summer and properly fed in winter, sanitary buildings, a pure water-supply, clean milking, prompt and thorough cooling, and distribution in sealed bottles or cans. Pasteurization is not an ideal method of dealing with the present-day milk. The medical evidence against pasteurization has grown rapidly, and appears irrefutable. Pasteurization is resorted to only as a necessary evil and nothing more. The tuberculin test he believes is not always to be trusted, because post-mortem examination occasionally fails to reveal any trace of tuberculosis in cattle that have reacted, and, on the other hand, that many of those that do not react are tuberculous. Better milk must cost more. If the farmer is to employ extra labor to groom cows, provide clean clothes for milkers, ice for cooling, dairy maids to bottle milk and wash bottles, etc., milk must cost something more. If this cost is to be borne by the farmer, his interest in reform will be limited. Economy in distribution would make a great saving, and municipal distribution might solve the problem.

The Milk Supply of Edinburgh.—Aitchison Robinson (Med. Press and Cir., London, 1905, n. s., lxxix, 102-104) states the increase in tuberculosis among cows during the past few decades has corresponded with the growth of the custom of keeping the animals confined in barns so as to increase their milk supply. The facility with which this disease spreads under these circumstances may readily be understood when we remember how careless and imperfect are the means employed of cleansing barns of manure, urine, in both of which and in expectoration on the walls of the stable, tubercle bacilli have been detected. The fact that on the same employe devolves the duty of cleaning the stall as well as milking the cows causes surprise, not that the milk contains filth, but that it does not contain more.

Manure in Milk.—Philip W. G. Nunn (Jour. Royal San. Inst., London, 1905-6, Vol. xxvi, 417) says: Apart from sentimental reasons, what are the main objections to the presence of manure and excess of bacteria in milk? First, its keeping properties are reduced to *nil*, except by artificial means; second, its nutritive properties are diminished and altered; third, it not infrequently acquires pathological properties, especially in the summer time, which give rise to the numerous disorders, varying in intensity from a temporary upset to vomiting, diarrhea, and other symptoms comparable to mild ptomain poisoning. The explanation of these facts is not difficult. When bacteria grow and flourish in the milk they take certain elements from that food for their nutrition; they also contribute something, *i. e.*, their waste

products; the latter are frequently virulent and possess toxic or poisonous properties. The object of these details is to emphasize the fact that milk which is submitted to the action of bacteria undergoes marked detrimental changes, and as cow manure is the most fertile source of bacterial invasion of milk, it is highly desirable for dietetic and hygienic reasons alone to reduce this form of pollution to the lowest degree possible. It appears questionable whether the desired degree of cleanliness in milk production will ever be reached without assistance of more drastic legislative measures.

Bacteria Counts of Boston Milk Supply.—Hibbert Winslow Hill, and Francis Henry Slack (Boston Med. and Surg. Jour., 1904, cli., 708-711, also Jour. Mass. Assn. Bds. Health, Boston, 1904, xiv, 236-248) advocate that the greater part of the milk is brought to Boston in eight and a half quart cans and is supposed to be from six to eighteen hours old. A few contractors deliver the milk at once to the consumers; the majority however after mixing, store it on ice until the following morning. Occasionally it is kept until the third day. Greater care is taken of the milk bottled for family trade. Mixing of milk is carried on by many of the contractors. In summer, millions of flies hover around these mixing rooms and are frequently found in the milk, having gained entrance during the mixing. Tasting of milk is allowed, licking the under surface of the wooden stopper and a few minutes later inserting it again into the can when the milk has been mixed, is frequently seen. In one place the largest cans are tested by the finger dipped into the can of milk and then to the mouth. Pasteurization is carried on in Boston only to a limited extent. The dirty milk cans are held accountable for many of the high bacterial counts. The wooden milk can stopper is used almost exclusively. The milk gets into the pores of the wood and renders it impossible to sterilize the stopper in any manner. However the general outlook for a better milk supply is bright.

Sources, Effects and Prevention of Dirty Milk.

—Chas. Harrington (Jour. Mass. Assn. Bds. Health, 1904, xiv, 253-258) asks how clean milk can be produced and how the measures necessary for the prevention of the sale of dirty milk can be enforced? These are the two most interesting questions for the consideration of health authorities. Education of the producer, the middleman and of the general public is most necessary. Education by ordinary methods will be barren of results. The general public is indifferent. It knows the value of fresh milk but obstinately insists upon the delivery of today's milk early tomorrow morning rather than today during the forenoon. It prefers half-cleansed jars filled in a dirty horse stable from large cans kept over night in a dirty refrigerator to its own clean utensils which could be filled at the door. The public will not pay a fraction of a cent more per quart for that milk produced under sanitary conditions than that from the foulest surroundings. Unfortunately the medical profession is to a large extent apathetic or sometimes worse. Within a month he had heard a practitioner of some eminence characterize as "damned cranks" those who are interested in promoting clean milk. His children had grown up all right on good old-fashioned milkman's milk and this agitation made him sick! If the public is indifferent and cannot be educated what will be the attitude of the producer toward an education from which he can see no direct benefit but only increased trouble and expense. Can we expect him to employ extra help in order to secure perfect cleanliness, to improve the ventilation and the drainage of his barns; to remove the cow manure daily to a place apart, to sterilize his pails with steam, to buy ice for rapid cooling and to take other precautions merely to send a clean milk to market for which neither the middleman nor the consumer will pay a cent per can more than his slovenly neighbor receives? Will he feel repaid by the reflection that perhaps in the tenement where his milk goes there

is less sickness among the offspring of a foreignborn population in which he takes no interest? The question can be simplified by the elimination of the public, which does not care and must be saved in spite of itself. Deal with the producer beyond the city and the retailers within. The licensing of producers and dealers has done much good and has made improved local conditions. Revocating licenses on the ground of unsanitary conditions is a wholesome practice which educates by example. A rigid examination of milk is necessary. If milk is returned once or twice because it is of a filthy nature the education of the producer takes a sudden rise and he will soon find that dirty milk is a poor crop and that it cannot compete with clean milk. If he takes extra care let him be rewarded by a certificate which he can use in advertising his milk. The middleman and shoppers can be rewarded after the same manner and in a short time the milk trade will be composed of two classes—those who sell clean milk and those who sell dirty milk. Then it will be that the public will have to choose between the two.

Concerning the Spread of Typhoid Fever by Means of Milk.—The Monthly Bulletin of the New York State Board of Health states: A milk-borne epidemic of typhoid fever has certain characteristics. It is generally abrupt in its onset. A fulminant outbreak of typhoid fever in a previously healthy locality always suggests it, and while any other infected food may have a similar effect, and even a public water-supply may be infected on the instant, an epidemic in which numerous cases come to light within a few days may be suspected as of milk origin. Then, it is widely distributed, as much so as the milk from one source usually is, not affecting a whole community as when a public water-supply is at fault, nor limited to a compact neighborhood where a local cause is acting. Several members of a family of susceptible age are likely to be affected. All or nearly all of those affected will be found to have had milk from one vendor or possibly from a special part of his milk kept separate from the rest, and a considerable proportion of the families using the same will likewise be affected. With such characteristics of an outbreak, the suspected milk should be investigated along the lines which have been suggested. The acting cause was operative two weeks before the outbreak set in, and as in a recent case may have ceased to exist; this ought to be borne in mind. Milk lends itself so readily to infection, and when infected may spread the disease so widely that no one who has or in any way comes in contact with typhoid fever should be allowed ever to be about a dairy or to be in any capacity connected with this industry; and it should be remembered that this prohibition must continue for two or three months after recovery.

Une Goutte de Lait.—A. Dingwell-Fordyce states that on October 20 there opened in Paris the First International Congress of the "Gouttes de Lait." Comparatively small in number, its members, nevertheless, included, in addition to representatives of practically all European nationalities, representatives from Egypt, St. Petersburg, and North and South America, who had come especially to Paris to attend the meetings of the congress. Its duration was but for two days, and was prolonged for visits to institutions of the same suggestive name in Rouen, Havre, and Fecamp. That the actual management of the congress was a marked success was admitted on all hands, while never were French charms and tact more evident than in the kindly consideration and sumptuous hospitality which ensured the comfort and pleasure of all visitors. Many interesting papers were read and many heated discussions took place, and the different methods of working in the various countries were fully discussed; while the importance and success of the meeting were proved by the unanimous agreement to have a second congress in the near future. One cannot but hope that as a result of this International

Congress a much greater impetus may be given to the realization of their importance and the formation of similar institutions throughout the land. That it should be necessary to provide on a large scale for the artificial rearing of infants is doubtless regrettable, but in the economic and social conditions prevailing in the present day throughout practically all civilized countries, this question undoubtedly is one which has to be faced. For cases in which breast feeding, for one reason or another, is entirely out of the question, or where it can only partially be employed, were the "Gouttes de Lait" formed. Thanks to them, the infant is at least assured of a clean supply of nourishment in reasonable quantities, and if the instructions handed to each mother are sensibly acted on, the institution also acts as an important educational center. In the Hospital des Enfants at Paris there is a creche for children under one year of age who are seriously ill. Attached to this there are always several nursing mothers, so that when possible, human milk is given to the children, and otherwise they are given sterilized milk. Despite the utmost care and attention the mortality of this portion of the hospital never sinks beneath the appalling figure of 5%, undoubtedly owing to the massing together of numbers of infants all seriously ill. The results in the various "Gouttes de Lait" throughout the city are very markedly different. In all these institutions sterilized milk is used; the degree of sterilization, however, varying, as in some the milk is raised to a temperature of 110° C., and in others, 102° C. At the Havre Institute Dr. Caron uses milk sterilized at 102° C. for three quarters of an hour and he commences the very youngest babies with pure milk in very small quantities and gradually increases the amount given. Should a very young baby be unable to take this pure milk, the mother is instructed to add a definite quantity of water to each bottle. This method is obviously open to severe criticism owing to the impossibility of ascertaining the correct quantity of water used and also to the probable use of imperfectly sterilized water. In several of the country institutions in France the milk is merely pasteurized and not fully sterilized, but in the towns, pasteurization is not found sufficient. In New York, on the other hand, in the depots of Nathan Straus the milk is pasteurized, being kept at a temperature of 167° F., for twenty minutes. Modified milk is used here and no bottle is sold 24 hours after pasteurization, while the bottoms of all the bottles are rounded, a device noticed in none of the French depots. The value of the work of Nathan Straus in New York can be seen from a consideration of the following figures of the Health Department. These statistics show that the death-rate per thousand, of children under five years has gradually decreased from 96.5 per thousand in 1891, to 63.0 per thousand in 1904. In Belgium sterilized milk depots are very numerous, while in many towns in Germany it is essential to have a municipal "Goutte de Lait." In France these institutions are mainly managed by philanthropic societies, while in England almost all are managed by the municipal authorities and in our immediate vicinity we are fortunate in having the municipal depot of Leith. To any one seeing anything of the manner of feeding young infants of the poorer classes the value of a clean well-regulated milk supply cannot be obvious. That the method of sterilization and the percentage composition of the various milks distributed by different institutions vary very largely, serves merely to bring into greater prominence the great value of a clean milk, in moderate quantity and at regular intervals, and to whom should we look if not to the municipal authorities for the providing of this supply? Undoubtedly it is not asking too much to expect the medical officer of health to provide for this certified milk and at the same time to superintend the management of all babies fed on it.

Imported Milk in Berlin and the Causes of Infant Mortality.—Prof. Ostertog states that there is

some danger in the Danish milk, which, owing to the long transportation, cannot reach the Berlin housewife in less than 36 to 48 hours after milking, and must before shipment from Denmark be strongly pasteurized, *i. e.*, heated and chilled, in order to prevent its curdling in transit. In most of the Berlin households it is again boiled before using. This trade in pasteurized milk is attended with serious hygienic dangers to the consumers. The occurrence of infant scurvy is caused by feeding with pasteurized and sterilized milk. Dr. Newman demands that dealers in pasteurized milk be compelled to acknowledge the fact that it is pasteurized at the time of sale. Prof. Flugg, of Breslau, has demonstrated that pasteurized and sterilized milk are capable of developing very dangerous toxic properties. These toxic properties are produced by the peptonizing bacteria and are capable of producing fatal diarrheas. The sale of milk which has been heated in the usual manner should not be permitted, unless it is labeled "treated by heat, not germ free, and must be kept below 18° C. or consumed within 12 hours." Pasteurizing conceals decompositions that were in progress prior to pasteurization, and therefore contains toxic agents whose presence is not revealed either by taste or appearance. It is different with raw milk. von Behring states that it is but a question of time that the sterilizing of milk will be recognized as harmful in the nutrition of infants. Infants are not provided with sufficiently developed organs to assimilate the boiled and peptonizing proteids for the formation of blood. Raw milk alone is adapted for feeding babies provided it can be used in 24 hours after drawn from the cow. When boiled milk is kept in hermetically sealed vessels, the nature of the surviving germs determines the more or less poisonous character of the decomposition products. Numerous cases of intestinal catarrh are certainly caused by such toxic substances (toxoproteins) which exist ready formed in milk consumed and which cannot be rendered innocuous by reheating the milk. Behring also states that out of every 1,000 children born alive, 235 die during the first year of their existence, and out of every 1,000 male infants, only 510 survive. Among these again only a third turn out to be fit for military service. He attributes this high percentage of men unfit for military service very largely to pathogenic germs introduced into their systems during infancy through milk. Numerous observations have shown that nutrition with sterilized milk results in much smaller increase in body-weight than with unaltered cow's milk. Calves fed on pasteurized milk gain 30% less in weight in eight weeks than others fed on unaltered milk. All animals fed upon pasteurized milk developed in an unsatisfactory manner and in one of the stock farms in the domain of Teichen, 58% of the cattle raised on sterilized milk were found unfit for breeding purposes and had to be slaughtered, and similar failures were recorded at other stock farms. The market milk in Berlin is cow's milk prepared in the following manner: The milk produced in the province of Brandenburg has an average fat content of 3% or above. This milk can be mixed with impurity with skimmed milk so that the product contains 2.7% fat, the amount required by the police ordinance passed in 1902. The separation into cream and skimmed milk is conducted at a temperature of 35° C. to 40° C., consequently the skimmed milk contains millions of bacteria. The blending of whole milk and skimmed milk must therefore be regarded as objectionable in the highest degree and is one of the main causes of the high death-rate of infants in the great cities. It is seen from above: 1. That the warning against pasteurizing and sterilizing is fully justified. 2. That Flugg's demand to acknowledge at the time of sale, any treatment by heat the milk may have suffered should be made compulsory in Berlin. 3. That the sale of market milk should be stopped as soon as possible, as it allows the public to be deceived and is a menace to the lives of the little ones.

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The crusade against the noise evil is progressing as well as could be expected, and is extending to all parts of the country. Courts are wisely deciding that human beings have a few rights not mentioned in our arguments with George III. One of those is the right to a peaceful pursuit of health as well as happiness. In Massachusetts, it is declared by the Superior Court that objectionable noise is actionable. The whistle nuisance in factories and freight yards is being suppressed. In New York, through the efforts of Mrs. Isaac L. Rice, the deafening unnecessary or even wanton whistling of river boats is being suppressed and in this she is receiving the unanimous support of the medical practitioners, who are pointing out the nervous damage to both sick and well. Hospital patients have particularly suffered and must be guarded. It is a laudable crusade and we can well desire it to continue until cities are made endurable to the most sensitive.

The New York Dispensary law is giving the local physicians a great deal of trouble on account of the dreadful abuses of this charity. The conditions are just as bad in other cities and must be corrected. It seemed very noble, no doubt, to establish public dispensaries where the poor could get medicines and advice at low rates or freely, and many of these institutions are necessary to obtain clinical material for the instruction of students, but it is now evident that the people are being pauperized to an alarming extent. Quite a number believe that when a person gets sick, it is the duty of society to care for him, and not the duty of his family. It is a socialistic tendency, and in time would disrupt the family, which is now the basis of all social organization, and probably will be for a long time to come, if not always. At the autumn meeting of the New York County branch of the State Medical Association, the matter was fully discussed, the history of the legislation designed to limit the evils of the system was described, and many abuses were brought to light. Chiefly, it was

shown that here and there dispensaries had actually become a form of private practice, yielding a certain income to the managers. The cost to the patients was small, ten cents or so for the bottle or the medicine, and they got just about what they paid for, no doubt. They were dupes who thought they could get something for nothing, but it is really a sad thing to see this abuse. Rich men, or at least those in good circumstances, will apply for treatment, be satisfied with the examination, be it ever so perfunctory, and then go home with their medicine, feeling that they have made a good bargain. It almost borders on quackery—it certainly favors the growth of an unhealthy parasitism.

Dietetics in health or disease is probably the most backward of all the collateral branches of medical science. This is not at all surprising in view of the fact that practically nothing was known of digestion until the brilliant army surgeon, Beaumont, happened to run across Alexis St. Martin at Mackinac. Even yet the chemistry of the process is very obscure; it could scarcely be otherwise when we have so little knowledge of the chemic composition of the proteid molecule; nor do we know yet the when, why, and how of the oxidation of the fats and carbohydrates of the food absorbed from the digestive canal. Indeed, in some respects, there has been nothing added to what Beaumont learned in his classic experiments. Nevertheless, there is enough now known to put an end to haphazard and empiric advice to our patients or to the healthy who are anxious to live proper dietetic lives. Unfortunately, there is too often a tendency to generalize on insufficient data, and there are too many "half-baked" theories resulting. In addition, there are so many factors which vary the amount and quality of the food proper for any one age and condition that it is practically impossible at present to formulate any hard and fast rules. "What is one man's meat is another man's poison," is a proverb almost as old as the hills, and it shows that men have

long recognized the individual equation in dietetics. On account of this one fact there has been a general tendency to neglect the whole matter as a lawless one, to be solved by experiment in each case. The present problem is to find out why it is that foods suitable for one man are unsuitable for another. It will then be but a step to generalize from the facts and formulate rules which may be flexible enough to apply to all the variable factors of age, size, weight, climate, and work.

The nitrogen problem is at present occupying a great deal of professional and lay attention on account of a growing belief that the older estimates of the proper daily amount have been placed too high. The carbohydrates and fats have been temporarily shelved as matters of investigation on account of the enormous differences in individual needs. One of the curious errors of many scientific men is the belief that carbon is the basis of living tissue, a belief which we inherit from the early days of chemistry, when organic chemistry and the chemistry of the carbon compounds were identical. It is now known that the fats, sugars, starches, cellulose, and similar substances are productions of living tissue, made for certain ends, the main purpose being the storage of energy for the future use of itself or its offspring. Such foods, then, are fuels for heat and energy, and they are needed in varying amounts. A ship at its dock uses some fuel every day for its internal economy, but when it is on its voyage it requires vastly more for power. Likewise men in sedentary employments need vastly less than those performing active work or those exposed to cold. Determinations of dietaries show this relationship; soldiers in the fatigues of warfare, for instance, consume many times the daily fuel of a clerk, who might be perfectly healthy on an amount which would starve the soldier. It is possible to make very accurate estimates of the amount of food needed for every unit of work done, but the variations among men are so great that practical rules are difficult if not impossible. There has been enormous labor spent, and years of time, too, in collecting statistics on this one point. Volumes upon volumes of reports are on file, but it is disappointing in the extreme that the physician should have thus far derived so little practical benefit from them. In any one case there is but little we can do except say that the less work, the less fuel is needed. Deficiency shows itself in emaciation, but the dangers of excess are not so evident. Indeed, there are such marked differences of opinion as to the existence and degree of these dangers that the whole matter must somehow be cleared up.

Too Little is Known of Nitrogen Nutrition.—

What we need, and need badly, is an authoritative determination of the happy medium. If it is where Chittenden places it, then we are merely wasting good, expensive nitrogen by our present habits. As these habits are some thousands of years old, so far as we can determine, it is well to look into the matter more deeply before pronouncing definitely. There is some evidence that young men experimented upon have been injured in their vital powers. The only thing proved so far by Prof. Chittenden is that vigorous life is possible for some months or years with far less nitrogen than we habitually take, but the military history of besieged towns and garrisons told us that thousands of years ago. The dreadful manner in which disease subsequently carries off these soldiers may, perhaps, be the fate of those who economize in nitrogen too far. It is the vital basis of protoplasm—a nitrogen compound—and it must be supplied in sufficient quantity—probably it must be a trifle in excess—a rule which seems to be nature's guiding principle in all her vital operations. It is not yet proved that a little too much is specially harmful. Too little is known of the etiology of the lithemic conditions to assert, dogmatically, that excess nitrogen is the cause;—indeed, gout and rheumatism often attack those in poverty who are notoriously underfed. It is certainly true, on the other hand, that communities of English monks had to abandon vegetarianism on account of the destruction of health, even in their sedentary lives. They improved with more nitrogen.

Nitrogen starvation in the tuberculous is naturally suggested by the fact that such great improvement results from forced feeding with nitrogen. It is known that tuberculosis is specially prevalent among the underfed of the slums, and that it is quick and fatal among the lower races which are mostly rice-fed and starved for nitrogen. It is not a disease of the well-fed, and though alcohol is regarded as the chief cause of the susceptibility to the infection, it must be remembered that heavy drinkers are very likely to neglect their nitrogen nutrition. They may even be fat, yet in a condition of serious malnutrition, like our fat sugar-fed babies raised on condensed milk or the dreadful baby foods so highly charged with sugar. Stiller¹ recognizes a condition of congenital atonia as the basis for the habitus phthisicus—an asthenia due to faulty material of the tissue-cells—but it is safe to look for the ultimate cause in early malnutrition, perhaps prenatal. To be sure, there is a slight reaction against too great a forcing of nitrogen foods in incipient tuberculosis, but it is yet true that quite large amounts are still considered necessary in this stage, and

¹ Berliner klinische Wochenschrift, No. 38, 1905.

still larger amounts in the advanced cases. All these facts, together with the increased susceptibility of the underfed to all infections, should open new channels of investigation in the direction of nitrogen starvation. Economy in diet must not be carried too far, lest we overstep the bounds of safety. It is an axiom that no city has enough water unless it can have a surplus to throw away—paradoxical as that seems. It merely means that we cannot stint ourselves. Perhaps the same law applies to nitrogen—as well as money—it is always necessary to have a little more than enough.

Nitrogen diet in diabetes has come up for discussion in numerous medical meetings in the last few years, and the impression conveyed is the somewhat unfortunate one that only very hazy ideas are entertained on the subject. In no other disease is it possible to do so much good by appropriate diet, and yet the etiology of the condition is far from complete elucidation. One fact is evident, the starches and sugars which are digested and then delivered to the blood from the digestive canal are not oxidized, either in whole or part, and are excreted as foreign substances, in the meantime poisoning all the tissues. The organism must subsist on proteids and fats, and if they are not supplied in sufficient amounts, it consumes itself like the salmon, and the nitrogen waste is enormous. It probably is the nearest approach to nitrogen starvation which medical science presents and it deserves extended study from this point of view. There is a growing impression that the oxidation of sugars is done by enzymes produced both by the cells themselves and the pancreas. If the latter is diseased or is removed, there is of course an incurable diabetes, but if the lack of enzymes is due to a loss of nerve control, the condition disappears so soon as the nervous system is repaired. Curiously enough, this nervous depression, though prone to be due to the exhaustion of overstrains, may itself result from defective nutrition and thus glycosuria secondarily result from the very condition it magnifies. Albu¹ has recently called attention to the aepsia due to loss of nervous control of the stomach secretions, and finds a congenital neurotic condition and also a family history of other neurosis in every case, often disorders of nutrition or positive neurasthenia. There is thus a relationship between this and the diabetes of nervous origin and of both to the congenital atonia of the phthisic habit described by Spiller. This fully accounts for the remarkable coincidence of diabetes and pulmonary tuberculosis, which was formally more commented upon than at present. The possibility of finding some relationship of all these conditions to malnutrition of nervous

origin, and particularly to nitrogen defect, should stimulate renewed study in this direction. There are possibilities of valuable generalizations of great practical value.

The proper daily amount of nitrogen is a problem of an entirely different character. There is no doubt that carnivorous animals derive their energy from proteids, but how they do it is not quite clear—probably the proteids first become an actual part of the cell protoplasm and are then oxidized. It is known that the salmon, which make those long trips up stream without food, derive their energy from the oxidation of their own nitrogenous tissues. In wasting diseases man does the same—lives on his own tissues—but whether he can or should get his energy from nitrogenous food substances in health is an open and modern question. There is a beginning suspicion that he has evolved a mechanism for utilizing carbonaceous substances for fuel, and that if he becomes too highly carnivorous, he has insufficient apparatus to get rid of the products—urea, uric acid, and the like—which collect and overburden the tissues, giving rise to many abnormal symptoms. They resemble the clinkers of a furnace which is fed upon improper fuel containing too much solid residue—man, indeed, might be compared to an engine which burns oil and which has no mechanism for removing ashes, only flues for the gaseous products. Snakes, with their solid urine, are at the opposite extreme. So the opinion grows that man needs only enough nitrogen to keep up the repairs of the cellular protoplasm—and that very little will suffice for this purpose. It is not a coal, but can be compared to the iron and steel used in repairing an engine—very little in comparison to the tons of carbon and hydrogen used for energy. From an examination of hundreds of dietaries, there had been a general acceptance of Voit's estimate of 118 gm. of proteid for a man in moderate work, and as much as 145 gm. in hard work, though hard-working frontiersmen, soldiers, and teamsters in America have been known to take much more. Several physiologists, both in Europe and America—the most prominent being Prof. Chittenden of Yale—have conducted numerous experiments which have led them to a firm conviction that Voit's estimates are more than 100% higher than they should be. It is asserted that 50 gm. a day for a man at moderate work will supply all the nitrogen needed, and that the organism is much more vigorous from the fact that there is less work of nitrogen excretion. The carbohydrates and fats will supply all the energy needed and can be varied in amount to suit, and the results of their combustion are merely water and carbonic oxid, which are easily carried off. If these new theories prove to be correct, they

¹ Berliner klinische Wochenschrift.

certainly will cause a great economy in our food bills, whose chief expenses are in the nitrogen-bearing articles.

Nitrogen Food Decreases with Age.—This one fact is likely to be overlooked on account of the small amount needed in the earliest youth. The ovum at first needs scarcely anything except protein, and it absorbs an enormous amount in comparison to its own weight. The actual amount increases, of course, as the ovum develops into the fetus, and later, but its proportion to the body-weight probably undergoes a gradual reduction in time, so that in adult life, after growth increases, it perceptibly decreases. During the active period of adult life considerable nitrogen is needed for the secretions—even the epithelium of the skin and hair uses up considerable; but in old age the nitrogen intake drops to a very small amount. This law is probably at the basis of that extreme enthusiasm with which the new theory is being taken up by elderly laymen and physicians who have tried it practically. Many of them are in sedentary pursuits and need but little fuel and repairs anyhow. It is not at all unlikely that all men instinctively eat less and less as they get older. Whether it is safe to apply the same laws to young men in the fullest physical vigor remains to be demonstrated. Surely it is not proved that we can safely cut down the nitrogen intake of children.

Nitrogen starvation is the term used by botanists for the drooping and final death of plants deprived of nitrogen foods. At one time it was very necessary to determine where plants got their nitrogen, for they invariably showed more than the soil could supply. It was found that certain bacteria in the rootlets had the power of absorbing free nitrogen of the air in the soil and delivering the resulting nitrogen compounds to the plant. Certain plants (clovers and peas) harbor bacteria which do this to a great extent. Farmers have utilized these crops for thousands of years to enrich the soil; simply plowing them under will make the next year's wheat crop much larger. If the soil is sterilized and the nitrogen in it is destroyed, the plant will grow until it uses up the nitrogen of the seed from which it sprang, and will then stop growth and die of nitrogen starvation. It is not at all unlikely that many strange conditions of badly fed children are of a similar nature—nitrogen starvation. It is also thought that the lower races which exist in crowded masses (Chinese, Malays, and Hindus) are really suffering from nitrogen starvation. They have plenty of starchy rice for fuel and do good work like a locomotive, but do not keep up their repairs. When accidental strains come, they collapse. It is a notorious fact that they melt away under infections,

which well-fed Europeans resist. Perhaps the tissues lose the ability to destroy invading organisms. If the suspicion is well founded it will explain the dreadful prevalence of infectious diseases in the underfed poverty-stricken submerged tenth of our slums. At any rate, the suspicion is enough to warrant us in going slow about reducing the nitrogen intake of the young, no matter what we may think of its desirability in the aged. Indeed, it is not at all certain that carnivorous habits with too much nitrogen are more dangerous than herbivorous ones with its nitrogen starvation and subsequent lack of vitality.

A Study of Experimental Variola.—The work of Councilman and his Harvard associates upon smallpox material obtained during the Boston epidemic a few years since is well known. It is also common knowledge that their interpretation of the findings then made, namely, that *Cytoryctes variolæ*, Guarnieri, is a parasite and the cause of smallpox, has by some later investigators been heartily endorsed and by others just as positively rejected. In order further to settle certain doubtful questions, Drs. Brinckerhoff and Tyzzer were sent to the Philippines, where monkeys suitable for experimental purposes are available, to study that form of the disease. The results of their extensive researches as recently announced¹ appear entirely confirmatory of the Boston investigations. Monkeys and orang utans were found susceptible to variola inoculations, though not to exposure to the disease in a way that proves infectious for man; typical vaccine lesions were also readily produced. Histologically, the cytoplasmic forms of *Cytoryctes variolæ* were found constantly in all the specific lesions produced with variola or vaccine virus. Intracellular forms of the parasite were found in the nuclei of epithelial cells in variola lesions, but not in those produced by vaccine virus, thus showing these structures to be specific for variola. They were found in all types of epithelial cells, according as the lesion was produced in various parts of the body, and also in the endothelium of bloodvessels and in connective-tissue cells. Their occurrence in the cells of the corium and especially within the endothelium of vessels is regarded as suggestive of a possible means of dissemination of the organism in the production of the exanthem. This is partially negated by their presence in endothelial cells in a few of the vaccine lesions, a form of the disease in which general eruption never occurs.

Significance of the Cell Inclusions in Variola Lesions.—As before stated, this experimental work is regarded as entirely confirmatory of the findings pre-

¹ Journal of Medical Research, Vol. xiv, No. 2, January, 1906.

viously announced. Drs. Brinckerhoff and Tyzzer, who were active in the Boston researches, conclude from their work in the Philippines that "the occurrence and distribution of the specific inclusions is best explained by the hypothesis that they are parasites, and that as such they are the cause of the disease." Dr. Councilman, in an introduction to the report, gives reasons why all who have taken part in the investigations feel sure the cell inclusions are living organisms. At the same time he frankly states that questions relating to the parasite and its life history remain unanswered. The arguments for it being a living organism are based upon its resemblance to other things known to possess life rather than upon characters inherent in the body itself. The fact that as yet it has been found only in tissue cells, added to the difficulty of studying the disease with which it is associated, prevent the settlement of questions that would doubtless render the subject entirely clear. As stated by Dr. Councilman, further work demands a constant supply of virus and of animals for experimental work; of most importance now is the discovery of an animal susceptible to infection by exposure to smallpox. The studies herein briefly summarized must be regarded as further evidence of the specificity of the bodies described; that they are living organisms and the cause of smallpox cannot be considered as unequivocally proved. Whatever may be the final decision, the Harvard pathologists are to be heartily commended for the zeal with which they have prosecuted the study of this important question. The Philippine investigations also made valuable additions to our knowledge concerning experimental variola, the immunity following vaccinia and variola, and the interrelationship of the various types of the disease.

The remodeled Willard Parker Hospital and the new laboratory building in New York have been formally opened. The laboratory is considered one of the best equipped in the country. It is expected that much will be accomplished in the study of antitoxins. Already two substantial advances have been made. One of these makes it possible to ascertain within 20 minutes whether a suspected dog has hydrophobia. The other achievement has been in refining and concentrating antitoxin, which has been highly successful.

Nurse for Public Schools.—A resolution to appropriate \$32,000 to provide for the appointment of regularly trained nurses to visit the public schools and care for the pupils, is being considered by the Philadelphia Board of Education. It is claimed that owing to the lack of nurses the work of the medical inspectors is rendered almost valueless except as regards keeping children from attending school in cases of contagion. A school nurse will assist to keep up school attendance and to keep children well by seeing that they receive prompt attention whenever any symptoms of ill-health are discovered by the medical inspectors. It is urged that such nurses should be under the immediate control of the Bureau of Health.

BOOK REVIEWS

Appendicitis: Its History, Anatomy, Clinical Etiology, Pathology, Symptomatology, Diagnosis, Prognosis, Treatment, Technic of Operation, Complication, and Sequels.—By JOHN B. DEEVER, M.D. Third edition, thoroughly revised and enlarged. With 64 full-page plates, 8 colored. Philadelphia: P. Blakiston's Son & Co., 1905.

The third edition of this wellknown book contains 457 pages of text and 64 plates, 42 of the latter being new. New chapters include "The Function of the Cecum and Appendix," "Appendicitis in Children," "Chronic Appendicitis," "Typhoid Appendicitis," "The Blood-count in Appendicitis." Changes in treatment as the result of extended experience include the abandonment of saline purgatives, which the author regards not only useless in the majority of cases, but as positively harmful in some, and the omitting of irrigation in cases of general peritonitis. In other important points the teaching does not differ radically from that of the earlier editions. In general there is a lessened tendency to the use of dogmatic statements. This is commendable, and we believe is readily explained by the fact that Deaver now finds a quite general acceptance, in whole or in part, of his views, instead of the sweeping opposition with which they were first greeted. This obviates the necessity of what might be called an aggressively defensive style. The author's enormous experience with appendicitis renders his opinions of the greatest value, hence the chapter on treatment is the most valuable in the book. The enlarged chapter on Complications and Sequels is also particularly instructive. The typography in general is excellent. The book is printed on deckle edge paper with wide margins and gold top, a style unusual in this class of publications, and which unduly enhances the cost.

Clinical Diagnosis.—By RUDOLF V. JAKSCH. Fifth English edition. Edited by ARCHIBALD E. GARROD. Philadelphia: J. B. Lippincott Company, 1905.

A book so well and favorably known for years as von Jaksch's *Diagnosis* needs no extended comment. It is recognized as the standard German work on the subject and English editions are always welcomed. The editor has made important additions in the way of bringing the book down to date, and it will no doubt retain its well-deserved popularity. We are sorry to note that the book is made into a thick, bulky volume by the use of thick paper; it was long a model of bookmaking in this regard, and we should have preferred it to remain in the thinner, more serviceable style. We also believe English readers would prefer the numerous references given at the bottom of the pages instead of being grouped at the close of the book, with only the small numbers as a guide to their situation. These two points in no way mar the great technical value of the book, but nevertheless are of practical importance.

Chemical and Microscopical Diagnosis.—By FRANCIS CARTER WOOD. New York and London: D. Appleton & Co., 1905.

The title of this addition to the books on diagnosis by examination of the blood and the secretions and excretions of the body is much better than the term "clinical diagnosis," applied to many other works on the same subject. The author has in it embodied his experience in hospital work and in teaching clinical pathology, and presents it with the hope that it may prove valuable to students of medicine, hospital internes, and practising physicians. This, we believe, the book will do, and in addition will serve as a trustworthy reference and guide for the laboratory worker. In the use we

have made of the volume, we have yet to find it wanting in the desired information. The book contains 750 pages, and with the quality of paper employed is entirely too bulky for a book that is to be handled as much as is a work on this subject. Partly because of this fact, the binding is less substantial than it should be. If future editions are printed on thinner paper, reducing the thickness a third without necessarily lessening the text, a very good book will be presented in a much more serviceable form. The first 258 pages are devoted to a consideration of the blood. The technic for the various examinations is plainly given, and the plates of stained cells are good. Part II deals with examination of the gastric contents, and in order are parts devoted to the feces, parasites, oral and nasal secretions, sputum, urine, transudates and exudates, and milk. An appendix deals with stains, apparatus, reagents, and the like. The index is very complete, occupying 40 pages. The book throughout is well written and the printing is satisfactory. Minor points to which exception might be taken are present, but do not detract from the general satisfactory character of the work.

Methods of Morbid Histology and Clinical Pathology.—By I. WALKER HALL and G. HERXHEIMER. Philadelphia: J. B. Lippincott Company, 1905.

The authors have prepared this laboratory handbook for students and pathologists working in hospitals and institutes. In the 267 pages are collected all the valuable methods for preparing and staining tissues and other pathologic material. Many of the formulas are in exceedingly fine print, but in a book for reference purely this is allowable in order to keep down the size of the volume. We find very few typographic errors and can commend the book as a very satisfactory laboratory guide. On page 262, in considering the tubercle bacillus in urine, the statement is made that if it be impossible to collect the urine by catheter it should be centrifugalized; the only inference is that if it be obtained by catheter, centrifugalization is not necessary, which we are sure is not intended.

BOOKS RECEIVED.

[Prompt acknowledgment of books received will be made in this column, and from time to time critical reviews will be made of those of interest to our readers.]

Nervous and Mental Diseases.—By ARCHIBALD CHURCH, M.D., Professor of Nervous and Mental Diseases and Medical Jurisprudence in Northwestern University Medical School, Chicago; and FREDERICK PETERSON, M.D., President of the State Commission in Lunacy, New York; Clinical Professor of Neurology and Psychiatry, Columbia University. Fifth edition, revised and enlarged. Octavo volume of 937 pages, with 341 illustrations. Philadelphia and London: W. B. Saunders & Co., 1905. Cloth, \$5.00 net; half morocco, \$6.00 net.

Dose-Book and Manual of Prescription-Writing: With a List of the Official Drugs and Preparations, and the more important Newer Remedies.—By E. Q. THORNTON, M.D., Assistant Professor of Materia Medica, Jefferson Medical College, Philadelphia. Third edition, revised and enlarged. 12mo. 392 pages, illustrated. Philadelphia and London: W. B. Saunders & Co., 1905. Bound in flexible leather \$2.00 net.

A Textbook on Modern Materia Medica and Therapeutics.—By A. A. STEVENS, A.M., M.D., Lecturer on Physical Diagnosis, University of Pennsylvania; Professor of Pathology, Woman's Medical College of Philadelphia. Fourth edition, revised. Octavo of 670 pages. Philadelphia and London: W. B. Saunders & Co., 1905. Cloth, \$3.50 net.

The Elements of Homeopathic Theory, Materia Medica, Practice and Pharmacy.—Compiled and arranged from Homeopathic Textbooks by Drs. F. A. BOERICKE and E. P. ANSHUTZ. 196 pages. Cloth, \$1.00. Philadelphia: Boericke & Tafel, 1905.

Lectures on Homeopathic Materia Medica.—By JAMES TYLER KENT, A.M., M.D., Professor of Materia Medica in Hahnemann Medical College and Hospital, Chicago. 965 pages. Large 8vo. Cloth, \$7.00; half morocco, \$8.00. Boericke & Tafel, 1905.

Materia Medica and Clinical Therapeutics.—By F. J. PETERSEN, M.D. Published by F. J. Petersen, Los Olivos, California.

AMERICAN NEWS AND NOTES

GENERAL.

The annual summary of deaths of physicians in the United States and Canada shows that during 1905 there was a total of 3,045, as compared to 2,142 in 1904, a rate of 16.36 per 1,000. This differs but little from the rate for preceding years, though slightly less than in 1904.

Rights of Pullman Cars.—The Supreme Court of Alabama upholds the Pullman Car Company's right to exclude from its coaches persons suffering from contagious or infectious disease. The decision of the Supreme Court was in the case of the Pullman Car Company vs. Max Krauss, appealed from the city court of Birmingham. Krauss claimed \$2,000 on account of his removal from a Pullman coach. He gained a victory in the lower court, and this was reversed and remanded.

Quarantine Against Havana.—Dr. Rhett Goode, health officer for Mobile, Ala., has announced that a quarantine will be declared by Mobile against Havana and all Cuban ports on March 1. Mobile has escaped yellow fever for several seasons and does not wish to take any chances. Astonishment is expressed by the Cuban health authorities at the announcement. Dr. Carlos Finlay, chief of the health department, said that Cuba would be as fully justified in quarantining against Louisiana and Alabama. The last yellow fever case reported in Havana came to light February 7 and the patient recovered.

EASTERN STATES.

Want a Woman Sanitary Inspector.—The Brookline, Mass., selectmen are considering the petition presented by some of the women's organizations of the town for the appointment of a woman sanitary inspector. It was explained that the work designed for this inspector had been attempted by representatives of charitable organizations, but they had failed because of lack of authority. It is proposed that the woman inspector visit the homes of the poor, become acquainted with the families, and suggest improvements in the management of the house.

Massachusetts General Hospital.—According to the annual report, the accident cases treated during 1905 showed an increase of more than 700 over the cases treated in 1904. In 1904 the number was 4,738, while last year the hospital handled 5,459 cases. In the outpatient department the new cases show a decrease of about 4,000. The new building for women at Waverley, which was made possible by the bequest of the late Edward W. Codman, is to be called Codman House, by vote of the trustees. It is expected that it will be ready for occupancy during the year 1906.

The Blind in Massachusetts.—According to the recent report of the State commission there are about 3,000 blind in Massachusetts, and of these by far the greater proportion are adults. According to the preliminary census returns for 1905, only 354 out of 2,802 blind persons, or 12.6 % were under 20 years, while the adult blind numbered 2,443, or 87.2 %. Nearly two-thirds become blind at the age of 20 and upward. The commission recommends the establishment of a permanent board for improving the condition of the blind. The board should serve, first, as a bureau of investigation, information and advice, and to that end should carry on and perfect the inquiries already begun; second, it should serve as a bureau of industrial aid to find work and new forms of employment for the blind, and develop home industries among them; and third, the board should be empowered to establish and manage a system of industrial schools and workshops for the purpose of affording suitable blind persons instruction and work in the lines of industry best adapted to their needs.

NEW YORK AND VICINITY.

To Prevent Marriage of Insane.—A bill has been introduced into the Legislature forbidding the marriage of insane, epileptic, imbecile, and feeble-minded persons and providing that if 30 days before a marriage of persons known to have been in such a state, they shall file a physician's certificate of cure, the marriage shall not be considered illegal. Another measure makes it a felony for any person of sound mind to intermarry or live with such a person or aid in such a marriage. The punishment is ten years' imprisonment or \$1,000 fine, or both.

PHILADELPHIA, PENNSYLVANIA, ETC.

Smallpox in Penitentiary.—A convict in the Western Penitentiary at Pittsburg, who has been imprisoned for a year, was recently attacked with smallpox. The patient has been isolated in the infirmary and every precaution is being taken by the authorities to prevent a spread of the disease among the 950 inmates of the prison. All the prisoners have been vaccinated and the sanitary condition of the penitentiary is considered almost perfect. The case was reported to the Bureau of Health.

Philadelphians Appointed.—The appointment of Drs. Henry Beates, Jr., and Francis Randolph Packard, of Philadelphia, and R. W. Ramsay, of Chambersburg, to be members of the Board of Medical Examiners to represent the State Medical Society, put an end to a controversy that has been perplexing to the Governor. Dr. Packard takes the place of Dr. McConnell and he was strongly backed, but there were a dozen other aspirants who had strong support, and letters on behalf of one or the other of them covered the Governor's desk every day.

Stamping Out Smallpox.—Following an eight weeks' fight, during which time 52 cases of smallpox were reported, the Tamaqua, Pa., Board of Health feels confident that the epidemic has been brought to a standstill, and that within two weeks all quarantines will be lifted. Up to a little over three weeks ago, when the board decided to enforce the compulsory vaccination law, and appointed district physicians to make a house-to-house canvass and inoculate all the inmates who had not been successfully vaccinated within a period of two years, the epidemic was spreading rapidly. The effect of the wholesale inoculation was quickly apparent. The reports of new cases came in less frequently, and during the past two weeks but one new case has been reported, while the work of lifting quarantines goes on rapidly. At the rate of expense thus far, the cases will cost the borough about \$200 each.

SOUTHERN STATES.

Mortuary report of the city of New Orleans for the week ending Saturday, February 10, 1906: General diseases, 36; diseases of the nervous system and of the organs of sense, 16; diseases of the circulatory system, 17; diseases of the respiratory system, 20; diseases of the digestive system, 10; diseases of the genitourinary system, 15; puerperal diseases, 2; diseases of the locomotor system, 1; malformations, 1; diseases of infancy, 6; diseases of old age, 9; external causes, 8. Deaths: Whites, 92; colored, 50; total white and colored, 142. Deaths in hospitals and other institutions, 46; deaths certified by the coroner, 25; deathrate per 1,000 per annum for the week, whites 19.52, colored 29.54.

WESTERN STATES.

The Decline of Typhoid in Chicago.—The reduction in the amount of typhoid fever is the most remarkable fact in the sanitary history of Chicago during the last decade. The weekly bulletin of the health department reports that the mortality there from typhoid fever during the 10 years from 1885 to 1894 inclusive was 7.9 per 10,000. In 1891 it was 17.31, being greater that year than in any other city in the civilized world. After the drainage canal and intercepting sewers were built

the typhoid mortality was reduced in the decade from 1895 to 1904 inclusive to 3.2, and that in 1905 it was 90% less than it was in 1891.

OBITUARIES.

William G. Kibbe, aged 64, February 12, from apoplexy, at his home in Abbeville, La. He was graduated from Tulane University of Louisiana, medical department, New Orleans, La., in 1878. During the Civil war he served in the Confederate army.

Thomas W. Martin, aged 82, February 13, from a complication of diseases, at his home in Easton, Md. He was graduated from the University of Pennsylvania, Philadelphia. He retired from active practice about ten years ago.

William V. McKenzie, February 14, at his home in Metuchen, N. J. He was graduated from the College of Physicians and Surgeons, New York City, in 1884. He was a member of the Board of Health at Metuchen.

Charles M. Zeh, aged 79, recently from diabetes, at his home in Newark, N. J. He was graduated from the Albany Medical College; was a member of the Board of Health of Newark.

Thomas G. Wright, February 10, from complications following relapse of typhoid fever. He was graduated from the Albany Medical College (Albany, N. Y.) in 1896.

Benjamin B. Ferguson, aged 53, February 13, from apoplexy, at his home in Camden, N. J. He was graduated from the Jefferson Medical College in 1893.

Joseph Foulke, February 13, at his home in Milwaukee, Wis. He was graduated from the University of Pennsylvania in 1854.

THE PUBLIC SERVICE

Changes in the Medical Corps of the U. S. Army for the week ended February 17, 1906:

First Lieutenant JOHN W. HANNER, assistant surgeon, is granted leave for three months, with permission to return to the United States via Europe. Lieutenant Hanner is authorized to leave this division about December 29.—Major FREDERICK P. REYNOLDS, surgeon, leave granted for one month, is extended fourteen days.—First Lieutenant LLOYD L. SMITH, assistant surgeon, is relieved from duty in the department of Luzon, and will report to the commanding officer, transport Logan, Manila Bay, for duty thereon as transport surgeon.—Lieutenant-Colonel WILLIAM W. GRAY, deputy surgeon-general, is granted leave for one month, from about January 26.—JULIUS M. PURNELL, contract surgeon, will proceed to Fort McDowell for duty.—Lieutenant-Colonel LOUIS BRECHEMIN, deputy surgeon-general, is granted leave for one month on account of sickness.—Colonel JOHN VAN R. HOFF, assistant surgeon-general, is relieved from further duty at Fort Leavenworth and at the expiration of leave will proceed to Omaha, Neb., and report to the commanding general, department of the Missouri, for duty as chief surgeon of that department.—WALTER L. PHARES, sergeant first class, will be relieved from further duty in the Philippines Division about May 1, and sent on the first available transport leaving Manila, P. I., to San Francisco, Cal. Upon arrival at the depot of recruits and casualties, Fort McDowell, he will report by letter to the military secretary of the army for orders.—A board of officers to consist of Major George E. Bushnell, surgeon; Captain Edward L. Munson, assistant surgeon; First Lieutenant Paul C. Hutton, assistant surgeon, is appointed to meet at the General Hospital, Fort Bayard, March 12, for the examination of officers of the medical department for advancement.—First Lieutenant CHARLES N. BARNEY, assistant surgeon, will report March 12 to Major George E. Bushnell, surgeon, president of the examining board

at the General Hospital, Fort Bayard, for examination for advancement.—OSCAR F. DAVIS, contract surgeon, is relieved from duty at Jefferson Barracks and will proceed to Fort Des Moines for duty.—JAMES C. DOUGHERTY, contract surgeon, is relieved from duty at Fort Slocum and will proceed to Fort Jay and report in person to the commanding officer of the 8th Infantry for duty to accompany that regiment to the Philippine Islands, where he will report to the commanding general, Philippines Division, for assignment to duty.—JAMES E. SHELLENBERGER, contract surgeon, is relieved from duty at Fort Sam Houston, to take effect about February 25, and will then proceed to Fort Ringgold for duty.—Major HARRY M. HALLOCK, surgeon, leave granted on surgeon's certificate, January 22, is extended one month.—The advancement from the grade of first lieutenant to that of captain of the following-named assistant surgeons, with rank as captain from February 11, 1906, is announced: Charles R. Reynolds, Paul C. Hutton, Frederick A. Dale, William M. Roberts, Charles W. Farr.—First Lieutenant JOHN J. REILLY, assistant surgeon, having been examined by a board of officers and found physically disqualified for the duties of assistant surgeon with the rank of captain, by reason of disability incident to the service, his retirement from active service as a captain, under the provisions of the acts of Congress approved October 1, 1890, and July 27, 1892, is announced, to date from February 4, 1906. He will proceed to his home.—FRANCIS M. MCCALLUM, contract surgeon, is granted leave for one month, from about March 8, with permission to apply for an extension of one month.—FRANKLIN F. WING, dental surgeon, is relieved from duty at Fort Riley and will proceed to Fort Omaha for duty.—GEORGE T. FOURL, sergeant first class, General Hospital, the Presidio of San Francisco, upon expiration of furlough will be sent to Fort D. A. Russell for duty.

Changes in the Medical Corps of the U. S. Navy for the week ended February 17, 1906:

E. H. MARSTELLER, surgeon, detached from the Columbia and ordered home to wait orders.—J. S. PAGE, surgeon, detached from the Franklin and ordered to the Columbia.—E. P. STONE, surgeon, detached from the Naval Academy and ordered to the Rhode Island, February 19.—D. B. KERR, surgeon, detached from the Boston and ordered home to wait orders.—W. H. BELL, surgeon, ordered to the Nevada, February 24.—F. G. COOK, surgeon, detached from the Nevada and ordered to the Naval Academy.—R. R. RICHARDSON, passed assistant surgeon, detached from the Naval Hospital, Mare Island, Cal., and ordered to the Boston.—F. E. PORTER, assistant surgeon, detached from the Naval Hospital, New York, N. Y., and ordered to the Rhode Island, February 19.—F. M. BOGAN, passed assistant surgeon, detached from the Naval Hospital, Yokohama, Japan, and ordered home to wait orders.

Changes in the Public Health and Marine-Hospital Service for the week ended February 14, 1906:

FAIRFAX IRWIN, surgeon, detailed as member of Revenue Cutter Service Retiring Board, to meet in Philadelphia, Pa., February 15, 1906.—J. H. OAKLEY, passed assistant surgeon, granted leave of absence for one month, from March 1, 1906.—H. S. CUMMING, passed assistant surgeon, relieved from duty at San Francisco Quarantine Station, and directed to proceed to Yokohama, Japan, for duty in office of American Consulate, relieving Passed Assistant Surgeon Dunlop Moore.—H. MCG. ROBERTSON, assistant surgeon, detailed as member of Revenue Cutter Service Retiring Board, to meet in Philadelphia, Pa., February 15.—C. A. BAILEY, acting assistant surgeon, granted thirty days' leave of absence from February 13, 1906.—J. T. BULLARD, acting assistant surgeon, granted leave of absence for thirty days from February 13, 1906.

SOCIETY REPORTS

THE SOUTHERN SURGICAL AND GYNECOLOGICAL ASSOCIATION.

Eighteenth Annual Meeting, Held in Louisville, Ky.,
December 12, 13, and 14, 1905.

[Specially reported for *American Medicine*.]

[Continued from page 194.]

Operation for Large Rectocele.—GEORGE H. NOBLE (Atlanta, Ga.) presented the technic of an operation which was intended only for large rectocele. Small rectocele was relieved by the ordinary perineal operations. In large rectocele, not infrequently there was more or less tediousness, loss of blood in the denudation and certain objections to puckering the overstretched and distended tissues together and forcing them into the rectum. Furthermore, there were unsatisfactory results by infecting the strong and resisting rectovaginal septum. This operation was presented for the purpose of overcoming those objections. In the technic it would be observed that the rectocele is actually resected, and that the strong or normal rectovaginal septum above the weak occluding point is drawn down to the level of the levator ani muscle and securely anchored. 1. A thorough dilation of the anus and recleansing of the rectum. 2. Denudation of a wide collar, as it were, the ring around the neck of the rectocele, beginning high up in the vagina and extending near to the promontory of the rectocele. It was unnecessary to remove the mucosa over the last point mentioned, as it was cut away in the resection. By proceeding with the denudation from within outward, the veins of the rectovaginal septum were cut through at a high point and secured with compression forceps, and the necessity of repeatedly cutting the same vessels in the process of repairing the wound was avoided. 3. Two fingers were placed upon the promontory of the rectocele, carried into the vagina and cut through the anus, forcing the rectocele ahead of them, and in this way completely everting it through the anus. It was seized with a pair of forceps at the point where it protruded and was gradually drawn down, step by step, until the lax portions were secured and a feeling of tenseness was felt. If in drawing the anterior rectal wall down, the normal parts of the rectum did not come as low as the levator ani, the rectum should be liberated by dissecting it from the vagina, which would permit further descent and allow all of the overstretched tissues to project beyond the anus. 4. A light pair of compression forceps is then placed upon the neck of the rectocele just external to the anus for the purpose of holding it in position. 5. Two sutures, preferably medium-sized kangaroo tendon, were passed through the unruptured portion of the perineum close to the sphincter ani muscle after the manner Emmet inserts his tension sutures in perineorrhaphy. These two sutures in passing across from side to side should take up the prolapsed portion of the anterior wall of the rectum. When tied, they closely approximated and anchored sound or healthy rectum to the levator ani muscle and rectal vessels in the deep pelvic fascia. 6. The vaginal side of the wound was completed by doing perineorrhaphy. The protruding rectocele was amputated about three-quarters to an inch external to the clamp, and its edges closely sutured with continuous suture of catgut. The case was treated then as an ordinary perineorrhaphy, except that a wet soft dressing was placed over the protruding stump. The stump retracted within the anus in a week's time, and took care of itself. The author reported five cases, in which he did this operation, with very satisfactory results.

Starvation and Locked Bowels for from Ten Days to Two Weeks.—HOWARD A. KELLY (Baltimore, Md.) offered for a more extended trial in other

fields as well, a method of after-treatment which he had used in some 15 cases, for the most part in complete tears of the rectovaginal septum. The treatment consisted in two parts: 1. A very limited diet for from 10 to 15 days. 2. The locking up of the bowels during this period. The food was limited to albumin and water, giving nothing the day following operation, and but one dram every three hours in the second day, and increasing this a dram each day until the patient was taking four drams every three hours. In this way the patient was fed in all in a period of 10 days not quite three pints of albumin and absolutely no other food. One patient was continued for 15 days on this diet and without an evacuation. At least two very frail patients had been treated in this way. When the evacuation took place, two drams of licorice powder were given and in some cases an oil enema, and the passage was secured with the patient lying on her side so as to avoid any straining. In no case were there any scybala, or was there any difficulty with the evacuations. He thought this starvation plan of treatment might have a wider range of utility in treating dyspeptics and cases of hysteria, as well as in all kinds of plastic operations on the intestinal tract.

[To be continued.]

WESTERN SURGICAL AND GYNECOLOGICAL ASSOCIATION.

Fifteenth Annual Meeting, Held in Kansas City, Mo.,
December 28 and 29, 1905.

[Specially reported for *American Medicine*.]

[Continued from page 125.]

Some Observations on Renal Surgery.—D. W. BASHAM (Wichita, Kan.) in this paper dealt with certain questions concerning nephroptosis and features of suppurative diseases of the kidney, and pointed out the reasons why nephrorrhaphy sometimes failed to relieve the symptoms. He discussed the desiderata necessary to make the operation a curative one. He criticised the methods in vogue, and referred to the modifications necessary to make the operation a curative procedure by fixing the kidney in a natural position and of obliterating the enormous pouch resulting from the mobility of the kidney. After discussing suppurative diseases of the kidney, and referring to the principal diagnostic points, operative intervention, sequels, etc., he reported four cases. The methods of Jacobson and Edebohls gave permanent results, so far as anchoring was concerned, but he thought the kidney was fixed too low in the loin, too far from the center of the vertebral column, and too near the anterior wall of the abdomen. There were many operations which anchored the kidney permanently, but which were open to objection from the standpoint that the organ was not held in the natural position. Surgeons did too many nephropexies without making a thorough and painstaking effort to ascertain the conditions of the kidney, its pelvis, and the upper part of the ureter.

Discussion.—A. W. ABBOTT (Minneapolis, Minn.) said that in a series of over 2,000 examinations only a very small number of kidneys could be felt beyond the limits described in textbooks, but this was not in accord with clinical experience. There were very few of these patients who presented any symptoms referable to the position of the kidney, largely due to the fact, he thought, that the upper part of the ureter fell with the falling of the kidney. WILLIAM JEPSON (Sioux City, Iowa) said there existed undoubtedly a range of mobility of nearly an inch to every normal kidney, or, rather, a kidney that was normally placed. He believed that each case of movable kidney had to be considered by itself. A certain number of them had to be fixed. The

author was not a firm believer in decapsulation of the kidney, for the reason that it had been demonstrated experimentally by many observers in Europe that if a kidney was decapsulated, in the course of three or four months a new capsule was formed, and the amount of blood supply the kidney received from the new source during the time it existed was not sufficient probably to maintain vitality. C. W. OVIATT (Oshkosh, Wis.) said occasionally it was necessary to operate on cases of movable kidney. If an operation was undertaken, it seemed to him that surgeons should profit by the teaching of Harris, promulgated several years ago, of obliterating the space beneath the kidney rather than trying to suspend the kidney alone, either by the fibrous or fatty capsule. If one simply suspended it, undoubtedly there would be a recurrence of the displacement. The space beneath the organ should be obliterated by the Harris operation, making a new pocket of peritoneum, obliterating the space by a pursestring, as Harris did. A. E. BENJAMIN (Minneapolis, Minn.) said he had laid down three or four rules for fixing the kidney. One was when it showed evidence of hydronephrosis, due to a faulty position of the kidney, or to a faulty position or kinking of the ureter, not allowing free drainage. Another was when there was enlarged kidney, congested or dilated kidney, and when it was tender. On examining such patients one could elicit pain by palpating the kidney. Another condition was when the kidney seemed to produce obstruction of the alimentary canal, either the colon or duodenum, and accessory organs, such as the gallbladder apparatus, the common bile duct, etc. In such cases the kidney was prolapsed, adherent down in the pelvis, and the patients were troubled with obstipation, and by putting the kidney in position and relieving the adhesions, the symptoms would partially or entirely disappear. Patients with dilated condition of the stomach and a diseased condition of the gallbladder, when apparently due to loose kidney, were sometimes benefited if their cases were taken early.

Fractures about the Elbow-joint.—W. D. HAINES (Cincinnati, Ohio) said that the open method of treatment was to be commended in all cases of extensive joint involvement. After freely exploring the joint cavity, freeing it from clot, removing detached spicules, and fixing the fractured fragments, a strip of fascia from the arm might be inserted between the joint surfaces, after the method of Murphy in excision, or the Mosetig bone filling might be used, with a view to preventing adhesions until sufficient repair had taken place to permit of passive motion. The operation was completed by suturing the capsule, fascia, nerves, and skin with ample provision for drainage. The arm should be dressed in the fully extended position, placed on an incline, and a light weight applied. This position and dressing should be changed at the end of one week. After light massage the arm was redressed at a slight angle and permitted to remain for four or five days, when it was changed to as nearly a right angle as possible without pain to the patient too severely. Subsequent treatment consisted of massage and passive motion every third day for a period of three weeks. Local pain and tenderness were given precedence over crepitus by the author in the diagnosis. The use of weights to overcome muscular rigidity permitted of infiltration, diminished elasticity, interfering rather than assisting in the reduction of these fractures. The proper treatment of pain and swelling accompanying fracture was early reduction and the application of extension, ice or other adjuvants being deemed advisable. Immediate amputation was reserved for those extensive crushing injuries, such as bumper wounds, in which the circulation and joint were so badly damaged as to be beyond all hope of repair. The author expressed the opinion that fractures about the elbow-joint had been overtreated in the past.

[To be continued.]

CLINICAL NOTES AND CORRESPONDENCE

[Communications are invited for this Department. The Editor is not responsible for the views advanced by any contributor.]

USE OF SUPRARENAL PRINCIPLE IN NEURALGIA AND NEURITIS.

BY

HENRY GUY CARLETON,

of Jacksonville, Fla.

To the Editor of American Medicine:—I have the honor to offer some notes on results from the external use of the suprarenal principle in cases of neuralgia and neuritis.

CASE I was a neuralgia of the left infraorbital, the entire course of which was angry red and edematous, with sympathetic shooting pains in the supraorbital, maxillary, and temporofacial. The patient, wife of the leading man in a theatrical company, told me she had suffered similar attacks about twice a month for some years, always being greatly prostrated for several days. Morphine temporarily relieved when given in full doses, and depressing doses of acetanilid seemed to "lessen the throbbing," to quote the patient's own words. Acting on this hint from acetanilid that local hyperemia was at least aggravating the pain, I determined to apply adrenalin—enough by emptying the neighboring arterioles to relieve temporarily the irritated nerve of the pressure upon it, yet not raise the general tension. As it was necessary for the patient to play that night, opiates were out of the question. Temporary relief was all I hoped for. I applied possibly 15 drops of 1 to 3,000 solution of adrenalin chlorid, following the course of the infraorbital where the chief trouble obviously lay, carefully timing the result. In three and a quarter minutes the patient said the pain was gone and only a throbbing remained. In a minute more even that ceased. The sudden cessation of pain made her sleepy and her husband and I left her in a darkened room. In an hour we returned and found her still asleep. I directed that she be allowed to sleep as long as possible, and she awoke in five hours entirely free from pain. No return followed, and as weeks passed without a recurrence, I saw that in her case adrenalin had been not only a palliative but a specific. This was September 13, 1903. In a letter dated Halifax, N. S., December 19, 1905, replying to my inquiry, she wrote:

"As to my neuralgia, I have only had a few slight touches of it since that treatment, and they were so vague as not to make another treatment worth while."

CASE II occurred at Coconut Grove, Florida. The patient had neuritis of the palmar and plantar terminals—small red nodes, exquisitely painful. As usual in such cases, patient was just convalescent from typhoid. He had also a bad mitral lesion, from which he died four months later. He had walked but a few times in two weeks when I first treated him. When the pain made sleep impossible, his physician had always given him morphine sulfate 0.024 gm. ($\frac{3}{4}$ gr.), atropine sulfate 0.6 mg. ($\frac{1}{100}$ gr.), repeating if necessary, and suggested my doing this in like cases when he left the patient in my charge. On his next severe attack I applied adrenalin chlorid solution, 1 to 2,000, about 0.06 cc. (1 m.), to each painful spot. In five minutes all pain was gone and the patient slept soundly all night. Next morning I repeated the treatment. He went down to breakfast and had no recurrence during the remaining two weeks of his stay.

CASES III, IV, VI, VIII, XI, XIV, and XVI were of the infraorbital or supraorbital; in some there was local edema, some were accompanied by shooting pains in the malar, dental or temporofacial branches; one case by a dull pain in the upper malar. All yielded within four minutes to adrenalin, applied as in Case I, except the last three, in which I used adrenalin ointment 1 to 1,000,

and not over 0.06 cc. (1 m.). This preparation I found easier to apply and experiment showed me that from 0.06 cc. to 0.12 cc. (1 m. to 2 m.) was all that was necessary, applied along the course of the nerve where pain was greatest. The branch acting through sympathy needed no application.

CASE XI, that of a student nurse in St. John's Hospital, Long Island City, had a slight recurrence after sleeping seven hours, but it yielded instantly to a repeated treatment, and no relapse occurred in the two months she remained under my observation. It was her first attack and was of unusual severity, the upper infraorbital being turgid and angry red, and the supraorbital and temporofacial viciously active in sympathy.

The time between application and perfect relief did not exceed four minutes in any case, and great care was taken to avoid possibility of hypnotic suggestion causing or aiding palliation.

CASE V was a mild sciatica. Patient had had many attacks of great severity, each beginning in this mild form. I wished to await the full onset, but he begged not to allow the case to go further. Applied 0.12 cc. (2 m.) of the ointment along the course of the nerve. No pain remained after six minutes, though in four it was barely perceptible. No recurrence in three months. I have not heard since.

CASES VII, XIII and XVIII were temporofacial. Same treatment and same result. Case XVIII was that of my nurse at Dr. Ross' Health Resort, Brentwood, L. I. Her previous attacks had been frequent and savage for two years, recurring usually about every 10 days and defying treatment. She came to my room one day about noon and said it was impossible for her to keep up any longer. She had not slept the previous night and the pain was unbearable. I applied 0.06 cc. (1 m.) of adrenalin ointment, beginning at the juncture of the temporofacial and malar, where the pain was most acute, and continuing along the supraorbital. The upper branches of the temporofacial, though painful, I left untouched. To avoid hypnotic suggestion, I merely told her the application might put her to sleep after several hours. In 3 minutes and 35 seconds from the application she said the pain was gone. This was done on September 15, and up to December 23, when she replied to a letter of inquiry on the subject, there had not been the slightest recurrence, although her general health had at times been far from good. This patient, as well as the one following, was under the supervision of Dr. Wm. H. Ross, Brentwood, L. I., owner of the Ross Health Resort, president of the Suffolk County Medical Society, graduate of the College of Physicians and Surgeons, New York City, and alumnus of the Presbyterian Hospital, New York City. I mention these details because he was the first physician I found who would consent to take even a languid interest in the subject.

CASE XIX was of rare interest. Patient was about 26, and had suffered from general neurasthenia for nearly three years, with several brief remissions. When I saw her in August she was very anemic, with partial paraplegia, aphonia, great prostration, but without the usual mental symptoms accompanying such a condition. Along the spine in the lumbar region were three painful nodes, which had been there without remission for two years. With Dr. Ross' consent, I told the nurse to apply 0.06 cc. (1 m.) of adrenalin ointment to one spot and plain vaselin to the other two, but gave no hint of the reason, or that the unguents were different. The nurse did this, reporting that the pain in the node treated with adrenalin disappeared in about five minutes, but that in the others remained. Next morning Dr. Ross himself applied adrenalin ointment to the other spots, with similar result. From what cause I do not know, but the patient began shortly to sleep without anodynes, to gain flesh and strength, voice and appetite returned, she walked a little alone, and no recurrence

of the pain had occurred up to the time of my departure late in October. Part of this may have been due to relief from pain.

CASE IX was neuralgia of the dental nerve—"jumping pain," as the patient described it. One minim of the adrenalin ointment stopped the saltation until next day, when, while eating ice-cream, a sudden ache in a lower tooth in that side revealed the cause of the neuralgia and brought a recurrence. Again it yielded to 0.06 cc. (1 m.) of the ointment, and the following morning the dentist found an exposed nerve in the affected tooth and killed it. No further recurrence.

CASE X was a closely localized neuritis just above the right elbow; had defied the mother's pet treatment with hot water and counterirritants for two days. Disappeared permanently after 3½ minutes; 0.03 cc. (½ m.) of ointment used.

CASE XII was of dental, malar, and temporofacial branches. Most acute pain near juncture of malar and temporofacial. Pain disappeared in 3½ minutes after applying 0.06 cc. (1 m.) to the chief seat of pain. Recurred in 14 hours—chief seat of pain being in the dental nerve, and no pain in the temporofacial nerve. I again banished the pain with 0.06 cc. (1 m.) of ointment, but suggested a visit to the dentist. The patient said her entire mouth had just been put in thorough repair. Again a recurrence in 11 hours, involving dental, malar, temporofacial, and supraorbital. On applying 0.12 cc. (2 m.) of ointment the pain disappeared from these nerves, but a dull pain appeared in a tricuspid on that side, and confirmed my diagnosis. Her dentist next morning found an exposed nerve, the entrance to the cavity being hidden. After he got through, the neuralgia never recurred.

CASE XV was a severe lumbar pain, not typically a lumbago. One minim and a half effected a cure, at least for two months, since which time I have not heard.

CASE XVI was a right-sided hemicrania. One minim applied one inch to the left of the axis, and on two especially painful spots along the line of the parietal sutures, gave quick and almost perfect relief. Patient then went to sleep and awoke free from pain.

CASE XX was of hemicrania attending a periodic attack of intestinal toxemia. Dr. Ross, as an experiment, applied adrenalin ointment to the base of the occiput on the affected side. Got no permanent result and but slight relief. I never saw this patient.

In CASE XXI the patient was treated by a homeopath in New York City, who was told of the adrenalin treatment by one of my friends. The vague report was that the pain "moved around so rapidly it could not be treated." The husband of the patient, a missionary, afterward called on me. He said his wife had suffered "untold agonies" constantly for years, but the pain skipped about her person with such celerity that nothing could catch it. Yet she was out constantly, visiting, driving, or shopping, always with the "horrible anguish." I suggested as a certain cure her complete submersion in water, hot or cold, for nine full minutes next time she complained, but stipulated that the submersion must be complete and uninterrupted for that period. If the "anguish" was not removed, repeat at once, doubling the time of submersion. He said he would suggest this to the homeopath.

CASE XXII, reported by Dr. Richard Kalish, of New York City, eye specialist, was of intense neuralgia of the supraorbital and infraorbital, obviously caused by a violent iritis. Adrenalin failed to do more than slightly relieve.

CASE XXIII was a severe neuralgia of the lower infraorbital, the chief seat of pain being from the right corner of the right eye to the outer edge of the right nostril. It had been of frequent recurrence for ten years. Adrenalin completely relieved in the usual time—three and a half minutes.

CASE XXIV, neuralgia of the dental nerve, or "jump-

ing misery," as the colored patient called it, obviously sympathetic, with an ulcerating tooth on the same side. The "jumping misery" fled in four minutes after adrenalin ointment had been applied along the course of the nerve, but the dull ache in the ulcerated molar persisted. Next day the neuralgia recurred and again yielded. Finally, the boy told me he "had done have dat dem tooth yanked" and trouble ceased.

CASE XXV, neuralgia of the supraorbital, infraorbital, and temporofacial, yielded permanently in usual time to 0.06 cc. (1 m.) of ointment.

CASE XXVI, just reported to me by Sollace Mitchell, of Jacksonville, Fla., whose name is too well known to need more than reference. Patient was a lady past 80, suffering from a closely localized neuralgia of the dental nerve. Dr. Mitchell had tried everything for two weeks, from quinin up and down. At my request he tried adrenalin ointment and kindly reported result at once. In about four minutes after the application all pain disappeared. Strange to say, after about eight hours it suddenly recurred with great violence, but in the temporofacial. Another application was made, with completely satisfactory results, with no recurrence to date—three weeks.

Late in November I sent notes on this treatment to a friend in San Francisco, asking him to request some prominent physician to try it in his practice. He gave it to Dr. Max Rothschild and sent me the following about a fortnight ago:

"1312 Van Ness Avenue,
San Francisco.

DECEMBER 28, 1905.

DEAR COLONEL:

The adrenalin salve which you suggested to me for different neuralgic pains has been used by me in two cases of supraorbital neuralgia, and the effect has been excellent. I also tried it with very good result in one case of intercostal neuralgia; in a case of neuralgia due to tabes dorsalis it did not have any effect. I thought it would interest you and so I left you know, thanking you for your suggestion.

Cordially yours,
(Signed) MAX ROTHSCHILD."

These cases I shall number for further reference herein, as follows:

CASES XXVII and XXVIII, supraorbital; usual good result.

CASE XXIX, intercostal, exact data not given, but effect reported as "very good."

CASE XXX, neuralgia, evidently arising from and sympathetic with tabes dorsalis. No result.

CASE XXXI.—Man of possibly 60 called upon me, suffering from dull bilateral pain in the upper branches of the temporofacial, also in the supraorbital, and both eyeballs. He could not indicate any specially painful point, but complained that his head was generally affected and also the region of the first cervical. He had been at one time a free drinker, but had been temperate for some years. He was a great meat eater, and drank but little water. Said that these attacks came on generally in damp weather, with low barometer. Sometimes the attack was intercostal, lasting several days. Suspecting a reflex irritability of the involved nerves from rheumatism, or possibly an unsuspected kidney lesion, I was not surprised when an application of adrenalin ointment to the supraorbitals, temporofacials, and just above the first cervical, failed to give more than slight relief. I then suggested abstinence from red meat, with diet, salines, and general flushing of the system to lessen these suspected conditions, and he promised to follow and report later.

CASE XXXII.—Severe neuralgia of the lower infraorbital, lasting 50 hours before I saw the patient, who had not slept for two days and nights. One application

of 0.06 cc. (1 m.) gave entire relief in four minutes, and a profound sleep immediately followed.

CASE XXXIII.—A recurrence in the patient whose case is given above. This time she passed the entire day "hopin' dat misery'd pass off." Then she went home to try hot-water applications, and passed a sleepless night in consequence. In the morning she came for treatment. One minim gave perfect relief in four minutes. This attack was not, as before, in the right lower infraorbital, but in the right temporofacial, coincident with an unusual spell of very cold and damp weather. I believe this patient will soon show up with one or more decayed upper teeth on the right side, though she affirms that her teeth are still entirely sound.

CASE XXXIV (reported January 26, 1906, by Dr. C. A. Woodard, senior medical of the Polyclinic and Postgraduate Hospital, Philadelphia, the first case in which he tried it).—Unilateral frontal headache. Patient said she often had similar attacks. Applied adrenalin to a small area over the supraorbital nerve, and it worked like a charm. I have not seen her since, but she promised to let me know immediately if she had a recurrence.

CASE XXXIV (communicated by Dr. Sollace Mitchell, Jacksonville).—Neuralgia of plantars, complete relief. No recurrence yet, after a lapse of 15 days.

Dr. J. J. Darby, United States Patent Office, Washington, D. C., called February 4, and told me he had often used adrenalin chlorid solution in various neuralgic pains, since my first communication to him in the winter of 1903-1904, with complete success. He had only a few minutes to catch a train, so could not go into details.

Being a traveler, I know that a few small bones, some chopped giblets, and a glass of bad sherry do not make a terrapin stew, and I am equally aware that these few cases do not establish a law; yet I think they can be fairly claimed to indicate as probable: 1. That at least in some cases of functional neuralgia and neuritis, idiopathic or otherwise, the suprarenal principle is a decided specific. (See Cases I, II, III, IV, V, VI, VII, VIII, X, XI, XV, XVI, XVIII, XIX, XXIII, XXV, XXVI, XXVII, XXVIII, XXIX, XXXII, XXXIII, XXXIV, and XXXV.) 2. That in most cases of clearly reflex or sympathetic neuralgia, it is a harmless palliative of great rapidity and potency of action (see Cases IX, XXIV, XXXI, and XXXIII), even though the relief be ephemeral. 3. That the failure of adrenalin to quiet permanently a yelling nerve may be accepted as diagnostic of some hidden lesion or disorder with which it is merely acting in sympathy. (See record of Cases IX, XII, XXI, XXII, XXIV, and XXXI.)

In conclusion, I may say that Dr. Sollace Mitchell and Dr. Wm. H. Ross authorized me to use their names, as I have done, in this article.

I have made no secret of this discovery during the past two years, requesting many of my friends in the profession to give the suprarenal principle a trial in neuralgic cases, and report results to me, good or bad. Many promised to do this, but evidently forgot, or, knowing already that it could not do good because not mentioned by the authorities, continued cheerfully in the good old shotgun way they were taught at college. Some were more frank. One even said to me: "My patients seem to prefer morphin, so why change?" Comment on this is unnecessary. Another was generously going to ask some of his colleagues in a great hospital to give it a thorough trial, but after he himself found it only gave slight relief to a cruel eye lesion, he abandoned his plan. Yet I told him at the time that in such cases no relief could be expected, but he knew far more about the subject than I, being limited only by his theory.

From these conservatists I have nothing to expect but a polite sneer. When they received their sheepskin, the illimitable in knowledge was already known, and nothing remained but the fun of putting it into practice. Neither will these facts be welcome to the fast-recruiting

army of those with whom medicine is a trade, not a profession, and the fee is the only good to be sought. A moment's work with a pencil will show these shrewd gentlemen that a hypodermic of morphin, t.i.d., at from \$3.00 to \$5.00 per punch, for three days, to be followed with a few tapering doses at the same rate, and subsequently by long course of good paying, even if unsuccessful experiments in morphin "cures," will profit them better than one application of absorbable ointment containing the suprarenal principle, and so I look for no enthusiasm in their ranks. But there are men still in the profession to whom the glory and honor of the science are still compass and sextant, and to whom the patient's good is more desirable than the patient's fee, and it is to these men I offer these few significant facts with absolute confidence that they will be proved on the first opportunity arising.

I have cited failures as impartially as successes, knowing that they are equally valuable in determining the limitations in this particular field of the suprarenal principle, the sphere of the potency of which I believe we are just beginning to get within parallax. Long continued uncertain health, the stress of my proper work, the lack of sufficient clinical material, and the general apathy I have found among the regulars to whom I confided my discovery and experiments, have led me to make this publication before I really could do more than give a hazy outline of the probable laws governing the phenomena I have adduced.

PINWORMS AS A CAUSE OF APPENDICITIS.

BY

E. M. DOOLEY, M.D.,
of Buffalo, N. Y.

To the Editor of American Medicine:—I was much interested in Dr. Monash's paper in reference to pinworms as a cause of appendicitis, published in your issue of December 15. The comparatively small number of cases of this kind prompts me to report one which recently came under my care:

Mrs. G., married, was admitted to the Mercy Hospital September 28, 1905. At the time of admission she was suffering from severe appendicular colic with vomiting. The pulse was small and thready with temperature normal. She was given strychnin 2 mg. ($\frac{1}{10}$ gr.) every 2 hours. An ice-bag was applied to the abdomen. Within 3 hours after admission the general condition of the patient improved and the colic ceased. October 5, the appendix was removed. It was two inches long and contained 20 pinworms. The vessels of the appendix were swollen and injected and the mucosa inflamed in patches. The patient made an uneventful recovery and was discharged from the hospital October 30.

PHARYNGEAL SNEEZE.

BY

THOMAS H. EVANS, M.D.,
of Philadelphia.

To the Editor of American Medicine:—Within a year a Spanish writer has noted what he calls uterine singultus, by which he refers to a peculiar expulsion of flatus by way of the vagina.

In two cases I have noted a similar curiosity, namely, a sound, between a sob and a hiccup, produced in nervous patients in attempting to avoid sneezing. The sound proceeds from the pharynx and occurs without warning on the suppression of the sneeze. I have found that this may occur in normal individuals, and have been able to note it in my own case suffering from a slight nasal catarrh. It is an example of transferred reflex and of some importance in showing the tendency of nervous excitement to find a vent by circuitous channels.

ORIGINAL ARTICLES

CLINICAL OBSERVATIONS IN EXOPHTHALMIC GOITER.

BY

GEORGE DOCK, M.D.,
of Ann Arbor, Mich.

The remarkable clinical picture of Graves' disease, the wonderful discoveries that have been made in the anatomy and biologic relations of the organ most obviously affected, that is, the thyroid gland, and the obscurity that still surrounds that organ, warrant, I think, a consideration of some of the many features.

I noticed very soon after going to Michigan in 1891, and reported in 1895 the existence of simple goiter in that and surrounding States, affecting very often 10% of young women and a smaller but still notable proportion in others. Most of the goiters were small, but many were moderate, and some large. The usual clinical varieties and complications of simple goiter were present. I looked carefully for other diseases associated with goiter or the thyroid gland. Exophthalmic goiter also seemed unusually frequent, but at that time few cases came under my own observation. (It may be of some interest to state that before 1896 exophthalmic goiter was classified as a nervous disease in the University Hospital.) Since 1896 I have had in the medical clinic of the University Hospital, out of a total of 4,000 patients, 32 cases. Beside these, I have seen 10 cases in consultation practice, but I shall limit my remarks chiefly to the former. Cretinism and myxedema, so closely related to goiter in general, are comparatively rare. Of the latter only one case, and that imperfect, has been in the clinic. On the other hand, neuroses in general, and enteroptosis in all forms, are comparatively common.

Numerous writers have called attention to the varying incidence of Graves' disease in different parts of the world, but without suggesting an explanation. My own locality differs from many others with high incidence such as North Germany and the Atlantic coast in the facts that it has a continental climate and is the seat of endemic, though mild goiter. Race seems to play no part in the production of my cases. Below I give the data regarding the probable etiologic factors. They differ notably in many respects from those currently regarded as important, more especially in the scanty family history of nervous and mental diseases, in shock, worry, or fright. The disease seemed to come on in these patients as do many other diseases, leukemia, chlorosis, and diabetes, without a definite or assignable cause. Perhaps further investigations will enable us better to recognize the exciting causes as well as the predisposing ones. At present, we have to diagnose the disease in most cases from the objective examination and some rather simple anamnestic data. It is important to realize what these are likely to be.

DETAILS OF THE CLINICAL FEATURES OF MY CASES.

Of my 32 cases, 29 were women, 3 men, giving a proportion higher as regards women than do many writers, though not so great as that of Murray (17:1). My 10

private cases make the proportion lower—37 women, 5 men.

These were all distinct cases in various degrees, though a few had been *fruste* at some periods. I have not included cases in which there was slight goiter and nervous symptoms, unless there were more important signs, such as tachycardia, tremor or exophthalmos.

As regards age, the youngest was 19; eight were from 21–25; two, 26–30; five, 31–35; six, 36–40; two, 41–45; four, 46–50; one, 51–55.

Of the women, 23 were or had been married; 6 were single. The men were all married.

There was nothing noteworthy in the occupations. All the married women kept house. The single ones were student, milliner, stenographers (2), or had no occupation. One man was a stonemason, one a farmer, one a steamboat captain.

Regarding predisposing causes, comparatively little can be ascertained. Some of the patients were perfectly well up to the beginning of the special symptoms. Many of them had the usual histories of diseases of childhood and of influenza. Twelve gave more or less distinct histories of more serious affections that may have had some influence in the development of the Graves' disease.

Mrs. T. P., aged 35, began to be nervous and to have tachycardia immediately after shock incident to the care of a son with appendicitis.

Mrs. S. P. H., aged 24, had a goiter for three years; lost weight for the last year; all symptoms became worse after nephropexy, nine months before admission.

A. L. T., aged 37, was subject to severe attacks of suppurative tonsillitis, which began before the Graves' disease, but recurred several times after that became clearly manifest, with increase of special symptoms, sometimes quite alarming.

Mrs. E. W., aged 25, had palpitation of the heart for some months, following influenza a year before admission. Two months later she was frightened by thinking her child had drunk carbolic acid. She had so rapid a heart-beat that she was supposed to be dying and was confined to bed for three months with tachycardia, nervousness, and weakness.

Mrs. D. H., aged 25, was never well after typhoid fever three years before admission, but rapid heart only began two years later.

Mrs. M. B., aged 23, was subject to attacks every 24 days, lasting for 4 to 5 minutes, with sharp pain in the heart region. Six months before admission the goiter appeared, soon after some trouble with the husband, which finally resulted in a divorce. The other symptoms followed the worry incident to this.

Mrs. A. G., aged 44, had "nervous prostration" from the twenty-sixth to the thirtieth years but fully recovered. She taught school before and after that. Was married at 36, had two children, without noteworthy effect on her health. Graves' disease began with goiter at 43. The only apparent cause was overwork.

In Miss E. P., aged 44, worry about a stepmother was given as a cause of the disease, which began with nervousness.

Miss I. B., aged 35, who had a goiter for many years was overworked in her mother's last illness. "Hardly slept for six weeks." Exophthalmos followed this in a few months, with extreme fatigue, persistent vomiting, nervousness, etc.

Mrs. M. B., aged 32, had weakness, tremors, palpitation of heart for four years, with remissions. A year

ago she discovered the goiter. Four months later, after curetment, the goiter rapidly increased in size, with edema of the extremities.

The family histories are almost wholly negative, and especially so as regards the oft-mentioned neuropathic tendencies. In only two cases is there a history of tuberculosis in the family. In one case a brother was epileptic.

In five cases immediate relatives had simple goiters. In two each a sister; in one the brother and two aunts; in two the mother and a sister; in one the grandmother. The brother of one patient died with exophthalmic goiter and in two other cases there is a suspicion of exophthalmic goiter in the family.

There is no discoverable relation between the Graves' disease and pregnancy or its complications. In three cases ill-health with uterine diseases had existed for from three to eight years previously, but without direct bearings.

In six cases goiter was the first symptom, followed rapidly by other symptoms, such as exophthalmos, tremor, palpitation, weakness, tachycardia, emaciation or nervousness, and irritability.

But in 12 other cases there was a goiter long before the other symptoms came on—from 3 to 37, usually from 5 to 12 years.

In two cases it is asserted that the goiters came late in the course of the disease, but it is easy to see how patients may be mistaken in regard to this. It is not uncommon to find patients who deny having enlargement of the neck, but have very distinct goiters.

It is much more likely that such a symptom as palpitation will first be noticed, and in fact 15 patients gave this as the earliest, or one of the earliest symptoms. In four others rapid heart-beat or frequent pulse was discovered early.

The thyroid gland was enlarged in all cases, in all but one visibly so, and in three reaching moderate size, 15, 16, and, in a large man, 19½ inches around the neck. Usually the visible enlargement was not very great, but the lobe or lobes easily felt to be enlarged on palpation. In one case of five years' standing the goiter was barely palpable, but evidently extended downward, and caused choking sensations. The patient said the gland had been larger up to one year before admission. In 15 cases the enlargement was almost or quite symmetrical. In 15 the right lobe was larger, in two the left. The consistency was described as "hard" only once; usually it was elastic and hard or soft, or soft. The vessels were often so full as to give a characteristic feeling. In four cases there were marked pulsations; in one case the veins over the gland bounded. A thrill was present in 22 cases, not present in 10. Sometimes it varied in the same case at various times. A systolic murmur, usually blowing, rarely humming or almost musical, could be heard over the gland, usually best just above the right sternoclavicular articulation, in 26 cases. In some of those it was sometimes absent, so that it may have been present in the others at other times. In seven cases there was a diastolic murmur. The murmurs varied in character at different times and were sometimes continuous.

The signs connected with the circulatory system are of great interest.

Palpitation, so frequent as an early symptom, was often present under observation, though it was usually less troublesome under treatment.

Tachycardia was almost always present, and in most cases persisted, though less severely, after improvement had been obtained in other respects. Of all the cases, in only two, and these in men with otherwise wellmarked cases, was the pulse-rate not increased.

F. K., a farmer of 40 years, had tremor, weakness, palpitation of the heart, goiter and exophthalmos for about a year and a quarter. On admission his pulse was 90, dropped to 68 when put to bed with an ice-bag over the heart, and ranged from 66 to 90 for the week he remained under observation, usually under 80.

L. F., steamboat captain of 36, complained for three years of bulging eyes, for two years of rapid heart and fatigue. People remarked "the manner in which his heart caused his shirt to move." On admission his pulse was 68. It was between 64 and 76 for about two weeks, and then usually from 70 to 82, though sometimes 62 in the morning.

In 18 cases the rate was between 120 and 140. In five, 100 to 120. In six, 140 to 160. In one it was usually about 120, but under excitement or at times of great weakness it would rise to 190 or even 225. At one time I counted it at the latter rate, being very distinct notwithstanding its rate, and got the same rate on the chronosphymograph.

Visible pulsations of peripheral arteries were noted in 10 cases. In four cases there was capillary pulse, without evidence of aortic disease. Flushing over the face, thorax, and sometimes the extremities was very common, and was often associated with coldness of the extremities.

The apex was displaced to the nipple line or beyond it in 21 cases. In six it was in the fourth interspace in the parasternal line. The absolute dulness was enlarged to the left in 16 cases, in four beyond the right edge of the sternum, once to the midsternum. The apex beat was usually distinct or strong. In one case only it was not visible, but palpable. Often it was heaving, sometimes described as "pounding," and in five cases it lifted the whole thorax. A diastolic shock could be felt in one case in the second right interspace. In one case there was a thrill once over the precordium. Arrhythmia was not uncommon, and often came on under observations of the pulse, without subjective symptoms. Reduplication of the second sound was noted twice; gallop rhythm once. The sounds were unusually loud, but murmurs were often associated with them. In 21 cases there was a murmur with greatest intensity at the apex, transmitted in various directions like mitral regurgitant murmurs in general; sometimes audible all over the thorax or even in the extremities. In four of these cases there was a different murmur at the base, systolic. In five others there was a systolic basic murmur. A diastolic murmur was audible in the aortic area in two cases, in which aortic disease could not be made out.

There was tenderness over the cardiac area in three cases, pain in two.

Aortic roughening was diagnosed in one case from

the murmur, aortic insufficiency in another, but in both cases without sufficient confirmation.

The pulse usually had the qualities of softness and quickness, either large or small; but some, even before blood-pressure observations were made, were described as having high tension.

In the following table I give some of the observations made on the blood-pressure. The Gaertner tonometer showed in one case not in the table a pressure of 132 to 146. In the first two cases the Cook instrument was used, with a 5 cm. band. In all the others the Stanton instrument was used, with 15 cm. band.

No.	Date.	Pulse.	Pressure.	Medication.—Remarks.
1	10-19-03	74	170-177	Tr. nucis vom., 20 drops, t.i.d.
	10-20-03	80	154-160	Nux and diuretin, 1 gm. (15 gr.), twice daily.
	10-21-03	68	142-160	Nux and diuretin.
	10-26-03	76	161-168	Nux and diuretin.
	10-27-03	76	156-160	Nux and diuretin.
2	10-19-04	124	182-189	Carlsbad salt, 16 gm. (½ oz.)
	10-20-04	122	182-175	Tr. strophanthus, 5 drops, t.i.d.
	10-21-04	120	150-155	Tr. nucis vom 15 drops, t.i.d.
3	10-18-04	120 (weak)	167	Tr. strophanthus, 10 drops.
4	3-15-05	120	118	Thyroidectin.
5	2-19-05	104	115, min. 84	Cascara.
	2-20-05			
6	3-15-05	116	145, min. 110	Cascara.
7	4-12-05	100	125	
	4-16-05	120	125	Ice-bag.
8	3-25-04	128	112	Strychnin, 2 mg. (½ gr.), t.i.d.
	4-23-04	128	138	Strychnin, 2 mg. (½ gr.), t.i.d.
	4-27-04	120	138	Strychnin, 1.6 mg. (¼ gr.), t.i.d.
	5-4-04	120	119	Strychnin, 1.6 mg. (¼ gr.)
	5-11-04	124	181	Strychnin, 1.6 mg. (¼ gr.)
	5-27-04	112	118	
	11-8-05	120	118	Phlebitis.
	11-10-05	120	148	
9	9-11-05	108	85	Thyroidectin, 0.32 gm. (5 gr.), t.i.d. Diarrhea: 4 stools daily after taking thyroidectin up to 3.2 gm. (50 gr.), t.i.d.
	10-16-05	112	98-100, min. 70	
10	10-12-05	90	100, min. 60	Before röntgen-ray treatment, sodium phosphate, 2 gm. (30 gr.), t.i.d.
	10-17-05	76	100	After röntgen-ray treatment.
	10-17-05	76	105	
11	1-20-05	124	169-148, min. 110	
	2-19-05	100	140, min. 90	Strychnin, 2 mg. (½ gr.), t.i.d.
	12-11-05	102	143	
12	2-25-04	124	182	Strophanthus, 5 drops, t.i.d.

In most cases there was no definite relation between the pulse-rate and the pressure, though that is of course a factor. In all cases the pressure fell under treatment, though not always very much, *e. g.*, 177 to 156; 186 to 150; 163 to 148.

With the apparatus we used, the minimum pressure cannot be measured with accuracy in all cases. In four cases in which it was most satisfactory it was 70 (maximum 100), 84 (maximum 115), 90 (maximum 110). The experience with blood-pressure estimations in exophthalmic goiter in my clinic was described by Drs. Morris and Edmunds¹ and I cannot add anything to their conclusion, which is that the high pressure in this disease cannot be explained by any simple hypothesis, such as rapid pulse. I think that more accurate investigations than are at present applied in the clinic may clear up the obscurity. The idea that the arterial pressure is low in exophthalmic goiter depends no doubt on the character of the pulse, which in many cases seems to the touch that of low tension. Sphygmographic tracings show that in many cases the tracing is high, quick in ascent and fall, without marked elasticity waves, and sometimes dicrotic. Such a tracing may be obtained from a vessel showing a maximum of 150 and minimum of 110 or with a lower pressure, as 125. But not rarely

the wave is not high, has a broad apex, and resembles that of a high tension pulse. Such tracings we have obtained with pressures of 175, 145, and also 100. With an improvement in the rate of the heart-beat, the pulse tracing often comes to resemble the normal, though it is easily made high and quick by the fatigue of having the tracings taken.

Edema was present in nine cases on admission, usually in the legs only. In one case it extended to the hip (fatal case, complicated with pelvic abscess). Two other patients gave a history of previous edema. Another developed general edema while in the hospital, of intense degree and great hardness without discoverable cause, but recovered from it.

Next to the thyroid and the heart and circulation, the eyes are of chief interest in exophthalmic goiter. In my series of 32 cases the eyes were negative in three only, that is, they showed no signs. In 8 cases the four signs, exophthalmos, von Graefe's lid sign, Stellwag's, and Moebius' weak convergence were present. Exophthalmos von Graefe's and Moebius' signs were present in 4. Exophthalmos and von Graefe, in 3; exophthalmos and Stellwag, in 3; exophthalmos and Moebius, in 2; exophthalmos alone in 4; Stellwag and Moebius, in 2; von Graefe and Stellwag, in 1; von Graefe alone in 1; Stellwag alone in 1.

It must be understood that these statements have a necessary limitation. It is not easy to draw a line between a normal but large and prominent eye and that of Graves' disease, and in persons with deep orbits the eye may be pushed forward and still not be prominent. Both Stellwag's and, as frequently, Graefe's sign may occur in cases that give no strong ground for the diagnosis of exophthalmic goiter, and both of these vary at different times in certain cases of the latter disease, as I have often observed.

In one case observed at three different times in the course of nine months, Stellwag's sign was present before exophthalmos and von Graefe's sign.

In one case the right eye, in two the left, was more prominent.

Divergent strabismus was present twice, but nothing could be learned of its occurrence. Neither ophthalmoplegia nor diplopia was observed.

Pain in the eyes was not uncommon. The conjunctiva was often inflamed. Subconjunctival hemorrhages were sometimes observed, but we had no severe ocular complications, such as ulcerative keratitis, of which I saw a striking example with Dr. McJunkin, of Dallas, Texas.

Reflex winking was sometimes lessened, as also the wrinkling of the forehead in looking up, but neither of these seem important symptoms. In one private case there was excessive lacrimation without crying.

The nervous system in my cases showed the usual changes. Thirteen had an anxious expression that seemed to harmonize with the appearance of the eyes. One was of melancholy appearance. In several, cachexia was the most striking feature in the facies. Some of the patients looked fairly well. All but four had constant tremor, best shown on extending the arms, sometimes very marked on attempting to write or to draw slowly a

straight line. The rate was generally about eight to ten per second. Several had tremor of all the extremities, sometimes the head also. In two tremor was absent at first, but appeared later. The other two were under observation only a short time.

Choreic movements occurred in two during the physical examination. In one of them (N. Y., aged 19) there was a history of chorea in infancy. Tingling and numbness were sometimes complained of.

Agitation and restlessness were very common, and the tendency to cry without sufficient cause; but they usually improved much under treatment. The same can be said as to poor sleep. This is one of the most common anamnestic statements, and it existed in five out of nineteen cases observed in the wards. In the others, sleep was quiet and sufficiently long within a few nights of admission, although the patients were in a large ward.

Psychic anomalies were not encountered. One patient gave a history of aphonia that may have been hysteric.

Mrs. D. H., aged 25, had palpitation of the heart one year. "Sometimes, from excitement, her heart becomes very rapid, her hands and feet become numb and cold, she cannot help herself, and if standing falls. She is conscious, but cannot move. These attacks are followed by great weakness." She had similar fainting spells before the palpitation began. There was also a history of cough and expectoration, but there were no physical signs of lung disease and no sputum while in the hospital.

Another patient, Mrs. P. E. M., aged 52, was weak for 15 years. Twelve years ago her neck began to enlarge, and the pulse became frequent—90 to 120. She had "spells" for all the 15 years about once a month, lasting from half a day to a day, in which she was so weak she was obliged to lie down, sometimes lost consciousness; never had convulsions. For about 10 years the attacks have been associated with smothering and trembling. She is conscious, but unable to move in the attacks.

All the patients complained of weakness, especially in the legs, and had weak grip. Only three had the striking symptom of giving way of the legs.

The emaciation of Graves' disease is well illustrated by my cases. Of the 32, 25 had a marked loss of weight. In 5 cases this was from 10 to 19 pounds; in 12, from 20 to 30; in the other 8, from 40 to 62 pounds. Some of the cases are very remarkable, as the rapid and great loss of weight does not seem wholly attributable to a diarrhea, though this often had a part in the process. Loss of appetite was also rarely present. In a case of one year's standing there was a loss of 52 pounds (108 to 56), beginning four months before diarrhea and progressing steadily. In another there was a loss of 25 pounds in one month. In another, with frequent diarrhea, there was a loss of 62 pounds, or half the original weight in one year, and a gain in the next year, under treatment, but with occasional diarrhea, of 42 pounds, 33 in 10 weeks. In some cases there was little or no loss. In a mild case there was, in fact, a gain of 38 pounds in two years. In a case beginning as an incomplete case there was no loss, but with the development of eye symptoms there was a loss of about 15 pounds, with a gain later of 11 pounds in one month.

Dyspnea is a very common subjective symptom, especially noticed upon exertion, such as walking.

Objectively it was noted in my cases only eight times, aside from exertion. Thoracic expansion is usually very slight in these cases, sometimes not more than 1.5 cm., but I have seen it three inches (28 to 31) in a well-marked case. Litten's phenomenon, usually easy to examine in these cases, is often very imperfect, one interspace, a half inch, or even absent, but in one case, moderately severe, it was three inches in excursion (not the same case as the one with three inches expansion). I consider the Litten's phenomenon a better guide than the expansion in these cases, since many people do not know how to expand the thorax, and yet have very good diaphragm movement.

I have had very little experience with fever in Graves' disease. In 15 of the cases there was no rise above 99.6°, the usual temperature being 98° to 99.2°, even in long-continued observations. One man with slow pulse (F. K.) had 96° F. to 98° F. during ten days' observation. All the symptoms were mild.

In eight cases the usual temperature was normal, but there were occasional elevations at single observations to 100°, 100.6°, or 101.6°.

In another, the temperature for three months was within normal limits, except once, from an overdose of thyroidectin, with chills and fever, to 101.6° F.

In 2 fatal cases higher temperatures occurred, to 103.4° F. and 107° F., but in the first case there was a complication with sepsis.

The changes in the skin were of the usual kinds. There was an unusual tendency to sweating in 18, none in 3. In some of the former it was at times profuse. The most marked case of this kind was one not included in this series, in a young professional man. Even after he became relatively well his face became beaded with perspiration on the least mental effort, and water would drip from his fingers when he carried out his not very exacting duties.

In 9 cases there was excessive pigmentation on the flexor surfaces or the abdomen.* In one there was a tendency to urticaria. In another to nodular erythema. One had a marked *tâche* on scratching. One had leukoderma. Falling of the hair was very common.

The accompanying table of the blood findings in 21 of my cases shows conditions such as others have noted. In contradiction to many of the early views a severe anemia or chlorosis is not often present. The most striking thing about the blood is the fact that the leukocytes are rarely increased, are below 6,000 in half the cases, and in that respect the disease resembles chlorosis and some other obscure diseases with anemia.

In 6 cases the lymphatic glands were enlarged, especially in the cervical region, also in 2 cases in the axilla and inguinal regions. Enlargement of the cervical lymphatics is especially important on account of the close relation of the lymphatics to the thyroid secretion.

In 2 cases the spleen was enlarged.

Digestive System.—The importance of digestive disorders, and especially of nausea, vomiting, and diarrhea, in Graves' disease, has been known comparatively long.

* In many cases the eyelids were pigmented before other parts of the body. Teillais has recently described this as a new sign, but it had already been mentioned by Ord.

Six of my cases gave a history of nausea and vomiting. One of these should probably not be counted, as the patient had a long-standing pelvic suppuration. None of them had distinct gastric crises, as I have seen in one case not in this series.

BLOOD.

	Hemoglobin.	Leukocytes.	Red corpuscles.
1.....	65	7,894	3,180,000
2.....	61	7,594	4,320,000
3.....	80	7,642	4,000,000
4.....	80	5,857	5,720,000
5.....	70	4,200	3,200,000
6.....	100	6,875	6,240,000
7.....	85	6,886	4,760,000
8.....	80	3,820	4,000,000
9.....	70	5,848	4,400,000
10.....	95	4,583	4,700,000
11.....	90	6,366	4,665,400
12.....	73	7,000	3,985,000 and lower
13.....	85	7,130	4,610,000
14.....	75	8,667	4,185,000
15.....	60	5,800	4,500,000
16.....	75	2,254	4,960,000
17.....	70	6,621	3,600,000
18.....	80	6,875	5,200,000
19.....	40	4,829	3,625,000
20.....	80	5,400	4,392,000
21.....	90	5,602	4,520,000

Ten patients had a history of diarrhea, or had this symptom while under observation. The diarrhea sometimes came on suddenly, with abdominal pain and with loose or watery stools to the number of 3, 5, 10 or even 15 a day. While in the hospital the usual number was 1 or 2, sometimes 3, only in 3 cases as many as 6 a day, at intervals. Almost all the patients took sodium phosphate or cascara. Sometimes the attack stops with no more treatment than light diet; sometimes it lasts for many days, in spite of astringents and intestinal antiseptics, with or without a preliminary purgative. The stools show nothing special, except poor digestion in some cases. There may be very good digestion, with as many as four or five stools a day. Sometimes the weight increases, while the stools are constantly increased to three or four a day. Constipation often exists in the intervals between the diarrheal attacks. Diminished urobilin is often suggested by pale stools, and the Schmidt bichlorid test often confirms this.

The further examination of the digestive organs is important on account of these symptoms. In only five of my cases was there gastropotosis, combined with other ptoses, and sometimes with Stiller's floating tenth rib. This is a little less than the proportion of cases of enteropotosis to all others (1 to 5 in women) as found in a large series by Dr. Arneill in my clinic.

The conditions as shown by test-meals in 6 cases, in only 2 of which the patients had had stomach symptoms and only 1 gastropotosis, are interesting.

They show good motor power, even hypermotility, in 5 cases. In the other there was 75 cc., 50 cc., 20 cc. 45 minutes after three successive test-breakfasts; 50 cc. 30 minutes after a test-breakfast; 15 cc. in the fasting stomach. Hydrochloric acid was reduced in 3 to a trace or nothing. In 1 it was (free) 6, 0, 5 in three meals, total 12, 0, 15; in another 0, trace 4, total 1, 15, 16; in another 8, total 26 (one test only). In one case (L. F., male), seven tests all gave no free HCl and negative tests for combined HCl. (This patient had very little history of diarrhea and none during four weeks'

observation, and has been fairly well for 15 months.) In the case without hypermotility the free HCl was 10, 4, 0, total acidity 20, 12, 12 in successive meals. Pepsin and pepsinogen were also low. In one of the cases with HCl low but present (10, 4, 0) there was no digestion in the Mette tubes in 30 hours. There was an excess of mucus in two cases. In one of them, the one without hypermotility, there were yeasts and bacteria in the fasting stomach. There was little tendency to diarrhea in this case. The others were negative in regard to stagnation.

It is of some interest to note that in one case the patient never eats meat. She has no history of diarrhea.

The urinary organs showed but little of interest. In three cases there were traces of albumin at times, with hyaline casts. In another, with great cardiac dilation, there was albumin equal to half the bulk by the heat and nitric acid test. In one case (fatal) with pelvic suppuration, there was albumin in large amounts, due largely to pus, but also containing hyaline and granular casts.

The condition of the sexual organs shows less abnormality than one might expect. Two women had passed the menopause before or about the time the disease came on. One had the ovaries removed on account of cystic disease after she came under my observation. One had had an operation for repair of the cervix. Four others had amenorrhea for from 3 to 12 months, one of whom (unmarried) was declared by a gynecologist to have hypoplastic sexual organs. One patient went through pregnancy without ill consequences, after she had improved greatly, a circumstance often noted by others, and one that I have observed in another case not in this series.

Further histories of the patients: As these patients were all seen in a general hospital serving largely as a diagnostic agency, and as nearly all of them lived at a distance, it was difficult to follow up their cases. Exophthalmic goiter is in fact one of the diseases in which the most valuable clinical investigations can be made by the private physician who is able to follow up the histories of whole families. The advantages of such a study appear in the suggestive work of Dr. W. H. Thomson,² but in his series the consultation element is also very large.

Sixteen of my 32 hospital patients have been lost more or less completely, though I am still in hope of learning something of them. Two died in the hospital. Twelve are occasionally heard from; two are under observation.

In one fatal case the death should not be ascribed to the Graves' disease.

Mrs. F. D., aged 35, had a goiter as long as she could remember. She had palpitation of the heart for many years, and thought her eyes had always been rather large. Fifteen months before admission she began to be nervous, having been worried by the care of some relatives. Six months later she had chills and fever, vomiting, and sweats. Menstruation ceased. She lost weight and strength. This was no doubt the time a pelvic infection was forming, for soon after admission she was found to have a rapidly growing fluctuating mass in the right side of the pelvis. She also had a symmetric goiter, the neck measuring 14½ inches, prominent

eyes, without Graefe's, Stellwag's, or Moebius' signs; a fine tremor of the hands; poor expansion and no Litten's sign; enlargement of heart without increased dullness; soft systolic murmur at apex; pulse 120; temperature 101.4° F. There was pigmentation of the flexor surfaces in the median line of the abdomen. The patient was referred to the gynecologic clinic, where an abscess was opened per vaginam. Nine months later the patient returned, with the signs of Graves' disease still present. The abscess had never healed. There was free fluid in the peritoneum. Edema of the legs came on, extended up to the body; leukocytosis of 18,000 per cm. developed and the patient died with the general features of sepsis.

The other fatal case was an acute one, the patient dying within eight months of the onset of the symptoms (goiter first), which followed anxiety, due to the prospects of an operation upon the patient's son. This case has been reported by my former colleague, Dr. J. R. Arneill.²

Of the patients still heard from, 6 were under treatment within a year from this writing. Another is still under treatment, much improved. She has been ill 2 years. Three others of this group have histories of total illness of less than 2 years' duration, 2 others about 1 year each, one 3 years and 9 months. Another, treated 4½ years ago, had been ill then 6 months. She now is quite well, with the exception of occasional tachycardia. Another, treated 2½ years ago, had been ill only 10 weeks when treatment was begun. She also complains of rapid heart at times. Another, ill 1 year and discharged 15 months ago with severe edema, recovered under the care of Dr. Conrad George, Jr., and is now fairly well. Another, discharged 21 months ago, having begun treatment within 2½ months of the beginning, still has the goiter, but the weight is greater than ever, the exophthalmos has subsided, the pulse is 80, instead of 126, and the tremor is gone. A man who came under treatment 5½ years ago within a few weeks of the onset, is now well enough to do hard work, having had a severe attack of typhoid fever 2 years ago. Another man, ill 3 years when he came under observation 2½ years ago, is also doing hard work. The goiter is gone and he weighs as much as ever.

It cannot be said that any of these patients are well, but they are sufficiently improved to take away the belief in the hopelessness of the disease. They also emphasize the value of early treatment.

Of the cases not known about now, 4 had been ill 1 year, one 1½ years, 3 each 2 and 3 years, and one each 5½, 8, 9, and 15 years. Since many of these had been taking the most adverse treatment, they speak just as forcibly of the prospects of the disease as do those in the other category.

Diagnosis.—Most textbooks dismiss the diagnosis of exophthalmic goiter with a few words on the impossibility of mistaking a wellmarked case for anything else. Others are less optimistic, but suggest that in cases not typical, time will do what the physician's efforts should. In other words, the matter is treated as the diagnosis of pulmonary tuberculosis was not very long ago, in which recognition began with advanced cases. And yet, in disease of obscure nature, in the so-called constitutional, nervous or metabolic disorders, quite as much as in tuberculosis, treatment is unsatisfactory in proportion to the

lateness of the period at which it is begun. In Graves' disease, not only in obscure or early cases, but even in wellmarked ones, the patients are not infrequently treated for anemia, chlorosis, palpitation of the heart, nervous prostration, or looked upon as hysteric and accordingly deserving neither treatment nor sympathy. If rational treatment were applied for any of the others, based upon a thorough examination of the patient, not only would no harm be done but the disease would often be cured before it could be diagnosed. As it is, such hasty diagnoses as are made end in giving iron, or arsenic, or "heart tablets" of questionable composition, or digitalis in a routine manner, or recommending exercise that amounts to overwork.

In the diagnosis of early and incomplete cases attention to a number of details will go far to prevent error.

Goiter alone is no proof of the existence of Graves' disease, but a small or medium-sized goiter, recent or of long standing, should always lead to further examination. If the goiter is of a consistency suggesting vascular enlargement rather than parenchymatous or still more, cystic, and when the vessels in the neck are prominent and pulsate more forcibly than usual the suspicion should be still further aroused. Of course it must be remembered that Graves' disease may exist with simple parenchymatous, colloid or cystic goiter, but the other form is more frequent. If there is also a murmur over the thyroid gland the goiter is almost certainly a Basedow goiter. As will be seen from my own cases, the murmur was not present in 18% of cases. But most of the negative cases were examined only once; none of them more than a few times. In three the goiters at the time of examination were very small. On the other hand, I have examined a great many goiters, with reference to the murmur, and aside from Graves' disease have never heard one of the same character. Twice I have heard murmurs over non-Graves' goiters but of a different character. In these cases there were changes, in one fibroid, in the other cystic, that gave reason to think there was pulling or pressure on the great vessels. The murmur in Graves' disease is usually systolic, but may be continuous or double. It sounds near, is usually loudest just above the right sternoclavicular articulation, and it can usually be distinguished without great difficulty from transmitted murmurs in the heart or aorta. Most common on the right side, it can sometimes be heard over both lobes of the thyroid. Fully described by Guttman and Moebius, and mentioned by me in 1894,¹ it appears to be so little known that it was rediscovered and reported by E. M. Fuller in 1901 as a "sleigh-runner murmur," a name that may be admitted as applicable if we remember the variety of noises made by sleigh runners. It hardly seems necessary. Thrill is a much less valuable sign than murmur.

In case such a goiter is present, the search for exophthalmos or other eye changes, for tachycardia, tremor, and other symptoms and signs is in order. If there is no goiter or exophthalmos, but only tachycardia and tremor, a diagnosis by exclusion must be made as regards both heart and tremor. Rapid heart should always call for a careful examination, since it occurs in so many and various diseases. The character of the tremor in

most patients with Graves' disease, if carefully examined, is so striking that it is one of the most important signs. The symptoms on the part of the nervous, digestive, or tegumentary symptoms, the loss of weight, the dyspnea, and poor expansion or feeble Litten's sign are of the utmost value in such cases.

Regarding exophthalmos and its use in diagnosis it may not seem necessary to say anything more, and yet having seen a professor of nervous diseases make a diagnosis of Graves' disease in a patient with chloromatous tumors in the orbits, causing proptosis, I feel that some caution is necessary. When such an exophthalmos is present as occurs in Graves' disease, without tumor, hemorrhage, or inflammation, a mistake can hardly occur. Far different is it when the exophthalmos is merely suggested. Sometimes the patient or her friends can tell whether the bulb is more prominent than before. Sometimes a photograph will help. Various pieces of apparatus have been devised to determine the existence or degree of exophthalmos. Though useful in noting the changes in a given case, they are of little or no value in diagnosis. It is in such cases that the careful examination for Graefe's, Stellwag's, and Moebius' signs is of most importance. While any or all of these may be absent in Graves' disease and present in some other disease, as neurasthenia or myasthenia, they should be looked upon as decisive if some of the other symptoms are present. No harm can be done by beginning simple treatment, in which all the signs, rare and common, of Graves' disease are to be sought for often and carefully.

The diagnosis of the degree and of the type in Graves' disease is of considerable importance, both for therapeutic and scientific purposes, but such distinctions should never blind us to the fact that the disease, so far as we can now tell, is one and the same, whether we call it complete or incomplete, primary or symptomatic.

The diagnosis of Graves' disease in *tabes dorsalis*, in *paralysis agitans*, in *iodism*, is to be made in the same way; but in these, as in all other cases, we should not allow a single symptom to give the diagnosis. For some patients taking thyroid preparations, a diagnosis of Graves' disease has undoubtedly been made without sufficient reason.

Pathology and Pathologic Anatomy.—It is not my intention to speak in detail of the pathology of exophthalmic goiter. I have not been able to add anything to what has been done by others in this part of the subject. It may be worth while, however, to remark on the fact that ever since the disease was first known, explanations of the pathology have been strongly influenced, indeed based upon current views of physiology and pathology in relation to organs and tissues imperfectly understood. So the conception of the disease as the result of a blood dyscrasia, as a cardiac affection, as a sequence of disease of the sympathetic nerve, or of the vagus, or of both together, or of the medulla oblongata—all these were simply the reflection of the temporary dominant ideas of pathogenesis. If all these in turn were abandoned, it was not because they were wholly unsatisfactory, but because there were elements of weakness in each theory that some other was thought to

escape. With the revelations of the functions of the thyroid, as shown by its extirpation, or by disease, as in myxedema, and with the discovery of the striking effects upon metabolism and upon various bodily functions that sometimes follow the ingestion of thyroid preparations, this organ claimed most attention, and in the brilliant hypothesis of Moebius came nearer the conception of an organic basis for Graves' disease than had ever been given before. But even if it were true that hyperthyroidization and dysthyroidization—not only increased but also perverted activity—occurred, all was not settled, the real cause was not known. In this stage it was not strange that explanations were forthcoming, such as that of Buschan, according to whom the disease is a general neurosis, with predominance of the psychic and vasomotor spheres, the vagus and sympathetic forming the paths of conduction to the thyroid gland. This was announced when the physiology of the thyroid gland was just beginning to be investigated, and when the exact details involved in Moebius' theory had never really been stated. It would have been just as rational to assume the thyroid disease is of microbic origin. Since then the physiology of the thyroid gland has been found to be much more obscure than was supposed in the early stage. Even more, the rediscovery of the parathyroid glands, and the remarkable, though as yet contradictory, results of experiments upon them, makes it clear that much must still be done before we can assign to either or both these organs their place in pathology in general, and in that of Graves' disease in particular.

Notwithstanding the great popularity of Moebius' theory, it was not possible to overlook the fact that it was too general. It really did not explain, and it is important to see what has been done in order to make it come nearer the needs of the case. The symptoms due to the administration of thyroid, whether as a remedy or as an experiment, correspond to certain others that had long been known to be characteristic of Graves' disease, but the whole picture has not been reproduced, and yet too much has been made, I think, of the imperfections. Von Notthafft's* case, following the ingestion of about 1,000 thyroid tablets, is still rejected by some writers, though if the history had given fright as the cause, few would hesitate to make the same diagnosis von Notthafft did. Loss of weight of 13.64%, enlargement of the thyroid, dyspnea, palpitation of the heart, extreme depression and *tædium vite*, excitability and insomnia, throbbing arteries and retention of appetite, made an imposing array of symptoms. Added to this were flushed and moist skin, exophthalmos, tremor, especially of the hands, thyroid gland not visibly but palpably enlarged, without thrill or murmur, throbbing carotids and brachial arteries, pulse 120, respiration 24, diffuse and heaving apex beat, Graefe's sign, winking infrequent; pupils, pupil reactions, vision and retinas negative, convergence good. There was 1% of glucose in the urine. Rapid improvement followed cessation of the thyroid, though the pulse for eight weeks was easily raised to 120 by slight excitement.

Edmunds' experiments on monkeys and dogs are

* Ein Fall von artificielllem thyreogenem Morbus Basedow. A. von Notthafft, Centralblatt für innere Medizin, April 16, 1898, p. 353.

almost as suggestive. W. B. Stanton's interesting observation of slight exophthalmos, wellmarked Stellwag, Graefe, and Moebius, tremor and diarrhea, in patients with tuberculosis involving the thyroid, deserves careful control in similar cases.

The confusion, not to say consternation caused by early experiments on the parathyroid glands, has subsided very much, so far as the complete relation of Graves' disease to those bodies is concerned. At the same time it is not impossible that some of the symptoms are due to alterations of the parathyroid glands.

This association is, perhaps, not the only one concerned. There is certainly a close relationship between the various so-called ductless glands. Whatever the starting-point of the disease under consideration it seems more than probable that various organs are drawn into morbid action. With the different degrees of activity of various functions, with the varying response of organs to irritants in different cases, much of the variability of the symptom-picture can be explained. That other organs than the ductless glands, the heart, various elements in the nervous system, the skin, gastrointestinal tract, genitourinary apparatus, and many others become involved, seems wholly reasonable. The peculiarities of my clinical material perhaps prejudice me in favor of the thyroid as the chief seat of the disease, but I am willing to await the revelations of future experiments and observations.

Pathologic Anatomy.—Regarding the changes in organs, it is enough to mention some of the more important features. Since Greenfield first pointed out the differences between the ordinary parenchymatous goiter and that of Graves' disease, a number of observers have reexamined the subject. Edmunds, MacCallum, and Hansemann have confirmed Greenfield's findings, and both the former authors compare the appearance of the gland with that following removal of part of the thyroid, like a compensatory hypertrophy, in other words, with proliferation of the epithelium, diminution of colloid, and rich vascular supply. That some others (Kocher-Langhans) have not found these changes is not remarkable, but is what one should be prepared for. The variety of appearances in the struma of Graves' disease, the total absence of struma in some cases, have long been known. What we need is an investigation of the histologic changes with reference to the type and stage of the disease in each case. Surgical operations for Graves' disease offer an important opportunity, in the use of which one must chiefly bear in mind that the changes may not be the same in the part extirpated and that left in the body.

The histologic study of parathyroids removed at such times, and also of lymphatic glands or hemolymph glands encountered at the operation, should also not be neglected.

Another important part of the morbid anatomy not yet sufficiently investigated is that of the muscular system. Askanazy's discovery of fatty degeneration that goes so far to explain the muscular weakness so characteristic of the disease, has not been considered often enough and is well worthy of control. In short, no part of the body should be neglected whenever there is an opportunity to make the examination in a fatal case.

Prognosis.—It has been said that none die and none recover from Graves' disease, but it would be more accurate to say that a few die, very few get well, but many recover a fair degree of health and retain it for long periods.

The actual mortality is impossible to state. As in other diseases, it is influenced greatly by the nature of the cases and the proportion of mild ones. It is also affected by the financial position of the patients. All statistics of such a disease are vitiated by the disappearance of the cases. Some authors give the mortality from the disease itself as high as 25%. Buschan in a large collection, including many hospital cases, found it to be 11.6%. The fact that many patients die of intercurrent disease is important not only because it affects the apparent deathrate. It is a factor always necessary to remember and to guard against.

In a given case the prognosis depends upon the severity of important symptoms, such as vomiting, diarrhea, emaciation, loss of strength, extreme cardiac dilation or weakness, severe nervous or mental symptoms. Acute onset in itself is not a bad sign. Improvement may be equally rapid. Even the most alarming conditions may be temporarily recovered from. A woman of 50 years, who had the disease for about 6 months, with general edema, severe cough and expectoration, moderate anemia, apex one inch outside the nipple line, systolic apex murmur, all eye signs, goiter with thrill and murmur, seemed to be steadily sinking, but suddenly improved, and has been fairly well now for more than a year. On the other hand, a chronic case may suddenly develop serious symptoms and end fatally. The improvement of important symptoms is always favorable, especially when weight, pulse-rate and character, and strength improve. The heart and the weight are the best guides to the course in most cases.

Even when patients believe themselves well it is often easy to detect important signs. Goiter, and even exophthalmos, is not of great moment in such cases, but a thrill or murmur over the goiter, Graefe's, Stellwag's, or Moebius' sign; tremor, poor sleep, or continued emaciation, or gastrointestinal symptoms show that a satisfactory stage has not been reached. Even after well-established recovery, relapses may occur, especially from overwork or any of the usual predisposing causes. Many patients not only feel better, but are better in cold weather. The prognosis is worse in general in proportion to age. Cases in childhood are too rare to offer certain conclusions. Perhaps the most favorable cases are those in the third decade.

Treatment.—The variety of measures used in the treatment of Graves' disease, and the enthusiasm with which some are lauded that fail entirely in the hands of many physicians show that no satisfactory remedy is as yet available.

I shall speak of certain methods not so much to encourage their use as to add to the general knowledge of the subject, and then take up the consideration of the measures I have found most useful.

Thyroid Preparations.—The use of thyroid in exophthalmic goiter is not, *a priori*, as irrational as many think. If the harm is done by a morbid secretion, it might be

that supplying the organism with a normal substance would assist in carrying the forces along until the function became normal. In order to test this theory, as well as to learn more of the effects of the gland substance, I used thyroid powder and tablets in 9 cases of Graves' disease in the hospital series, giving 0.32 gm. (5 gr.) three times daily. In one there was a distinct effect on the thyroid, as there often is on the simple goiters, the neck measure going down from 15½ to 13½ inches in 8 weeks. In two the neck did not become smaller. In the others there was such a slight diminution in size and consistency as we often see without any treatment. The pulse became less frequent in 3 cases, in 3 weeks, 7 days, and 10 days, respectively, the rate changing from 140 to 160 to 110 in the first, 124 to 110 in the second, 124 to 96 in the third. In the first the neck grew much smaller but the tremor and nervousness were worse, legs weaker, sleep no better than before, and the drug was discontinued. In another case the rate fell from 130 to 146 to 120 in 8 days, but perspiration became worse, urticaria broke out, the eyes were painful and the drug was stopped. In two cases there was a rise of pulse rate, 112 to 132 and 110 to 130, without other symptoms. Diarrhea, nervousness and pain in the neck came on in 2 other cases. In the others the tablets gave rise to no unpleasant symptoms. They gave a subjective sensation of benefit. From the absence of visible action in many cases in which thyroid preparations have been given, I have been led to believe the material is often inert. All I used was fresh from the makers.

In the early days of iodothylin I used that in two cases of exophthalmic goiter, also without effect. In the treatment of ordinary goiter with thyroid I have several times seen such symptoms as rapid pulse, headache, nausea and malaise, never becoming serious.

Thyroidectin is, *a priori*, a more promising substance than thyroid. In the latter we have to assume a series of possibilities, the most important of which are not likely to exist. In the case of thyroidectin we are supposed to have substances that are directly antagonistic to the thyroid secretions, to imitate as it were, and to prolong, the intermediate stage that has been seen when a patient with Graves' disease develops myxedema. Unfortunately we do not yet know whether the theory is correct, nor whether it is in any case possible to strike a balance between the antagonistic principles.

I have treated seven patients with this substance; three of the cases were very severe. I should add that in all of them rest in bed, the ice-bag to the heart, and other remedies such as sodium phosphate or strychnin, have been used more or less regularly. All the patients improved, but I could not see that the process was more rapid or otherwise different from those treated without thyroidectin, but the same in other respects.

The substance evidently has some action. Patients become accustomed to it, so that without a very marked beneficial action while taking it they feel worse when they stop. One patient has taken 18 bottles or 900 tablets in nearly a year, and has noticed the difference whenever she had to wait for a new bottle. Another patient had chills, fever to 101.6° F., headache, small weak pulse of 120, while taking 1 gm. (15 gr.) three

times a day, ascending at the rate of 0.32 gm. (5 gr.) three times daily. While taking 2.6 gm. (40 gr.) three times daily she had a similar attack. She had a history of such attacks without known cause three years before. The whole condition suggested an intoxication that might come from any nonspecific material, and not at all an excess of material antagonistic to thyroid; nor did it suggest a stimulation of thyroid production in excess. While taking the ascending doses of thyroidectin she gained weight as she had on 0.32 gm. (5 gr.) doses, gaining 20 pounds in seven weeks, standing still in the week the remedy was discontinued and beginning again with it. The general condition, nervousness, thyroid, and eyes all improved, but the pulse remained about the same, 110 to 120, though it was less irritable than before.

This case is a fairly good example of two others in which the remedy was given for a long time in increasing doses, to 3.33 gm. (50 gr.) three times daily. In another the pulse was made permanently less (114) than before (150), but not so low as it had been (94) under the use of the ice-bag. In another case the pulse was higher after five weeks' treatment with 0.32 gm. (5 gr.) three times daily. In two other cases the substance was not taken long enough to furnish conclusions of value.

Thymus extract was given in two cases, without obvious effect.

Suprarenal extract had been taken without benefit by two patients, both moderately severe cases, before admission, and it was continued for four and three weeks, respectively. The first patient got a severe relapse following vaccination in this time, and it seemed necessary to resort to more direct treatment. In the other case there was slight improvement in the pulse and a gain of three and a half pounds in weight.

I have seen several other patients who had taken suprarenal extract or adrenalin without benefit, and I cannot see any good theoretic reason for using it.

Röntgen rays were used in two cases of moderate degree, of one and a fourth and two years' standing with moderately large goiters. They received ten minutes' exposure from a moderately hard tube, at ten inches from the anticathode, static machine current. Eighteen and twenty-seven exposures respectively had no distinct influence on the size of the goiter, or the other symptoms, though there was such an improvement in each case as we usually see in patients who devote themselves to almost any form of treatment. Although many writers speak favorably of the effect of röntgen rays in simple and exophthalmic goiter, it seems to me that actual reports are suggestively scarce. I have heard of several others whose experience has been as unfavorable as my own, and with far greater material.

The treatment that I have found most useful is based upon the chief symptoms and the fact that many patients improve spontaneously. Although it seems to me the best we have at present, I admit it is unsatisfactory in the length of time it requires, and the adoption of a rather careful mode of life. I therefore look upon experiments at more specific treatment as most rational. They do not need to interfere with the most essential parts of the other treatment.

The elements of the treatment I have found most useful are rest, diet, care of the stomach, intestines and skin, with special attention to symptoms such as those of the heart, nervous system and other organs when necessary. Some details of this form of treatment need further elaboration.

Not only the degree of severity of the case, but each individual case requires special consideration, and the personality and psychic peculiarities must be as carefully investigated as the size and function of the heart or the condition of the stomach or blood.

In mild cases little more than rational living is necessary. In severe cases rigid rest treatment with active treatment for all important symptoms is essential. The great number of moderately severe cases requires a treatment touching the other two at certain points, and it is convenient to speak more fully of these.

Rest is indicated by the weakness, the great tendency to fatigue on all sorts of exertions and the anatomic findings of Askanazy, already mentioned. Rest is more likely to be taken when it does not demand too much of the patient's necessary or imaginary duties. Instead of ordinary rest in bed in daytime for such patients, I recommend long hours of bedtime at night, and lying down instead of sitting or standing at all times when not actually engaged in work requiring another position. Reading, for example, can be done in the reclining position. (I need hardly add that the kind of reading done by a patient with Graves' disease is often necessary to control.) In the case of school teachers, housewives and many others a very definite rest can be obtained in this way, and the patients would be quite unable to follow the advice so often given, to go to bed at certain hours every day.

The importance of mental rest is obvious, but the same principle obtains here. Many patients throw off a good many unnecessary causes of mental fatigue, just as they can lie on a couch instead of sitting, but cannot avoid all mental exertion, nor is it likely they would be wholly benefited if they could.

Exercise should be taken by these patients always short of the point of fatigue, and in the open air. I have seen many patients injured by the often mysterious but sometimes severe methods of the physical culturist. If patients have no time or are too weak to exercise in the open air, it is of great benefit to have them lying down out of doors, protected from the weather, and as long as possible.

It is hardly necessary to say that the hygiene of the bed-room must be looked after.

Bathing must be adapted to the patient's condition and facilities.

The diet should be varied, as full as possible, and all symptoms on the part of the stomach or bowels be promptly corrected. Overfeeding is often but not always necessary. The scales should be used regularly as a guide. All injurious articles of food or drink should be avoided. Certain foods can sometimes be found to have a bad effect not only upon the gastrointestinal tract, but also the heart.

Tachycardia should always be treated by rest first, and even if severe, no drugs should be given until the

patient is at rest. As a cardiac sedative and tonic the icebag should first be tried. Many patients soon recover from palpitation and rapid pulse under this treatment. Digitalis, so often used, is not theoretically indicated for the tachycardia of Graves' disease, but is valuable in cases of dilation or astyole as a direct stimulant. Strophanthus seems more useful for palpitation and tachycardia, and, I think, can be combined with strychnin with great advantage in such cases.

For nervousness and sleeplessness, rest, fresh air, a cool bedroom, and comfortable bed are more important than drugs. A warm bath before retiring, a hot drink, and a hot-water bag to the feet should always be tried before resorting to drugs. If these fail I find it better to give a large dose of bromid occasionally rather than small repeated doses. Hypnotics, too, should be used only in emergencies and never for long periods. Opiates should never be given in a mild or moderately severe case.

For the stomach, dietetic treatment often suffices, even when there is low hydrochloric acid. If necessary, special treatment should be carried out. For the prevention of diarrhea, proper diet and regular action of the intestines are essential. Constipation should be treated according to its degree. Sodium phosphate is a useful drug in many cases, but I am not certain that it has any advantage over cascara. I have given the former for long periods in doses of 1.3 gm. to 4 gm. three times a day without seeing any specific effect.

In gastric or intestinal crises early evacuation should be practised by the stomach-tube, cathartics and enemas. After that bismuth, antiseptics, or sedatives may be necessary, though they are not always.

The anemia of Graves' disease usually improves under simple treatment. Iron and arsenic should never be given without sufficient reason.

It is hardly necessary to describe the treatment for such complications as fever, or such associated diseases as are sometimes present in the nose, pharynx, eyes, genitourinary tract, or skin.

Electricity I have never used. Most of my patients have had it in various forms, and sometimes with benefit, but I have been convinced that the chief action is a suggestive one.

I cannot speak of the surgical treatment of Graves' disease from personal experience. Partial thyroidectomy is the only one necessary to consider now, and there is no doubt that this is often followed by improvement so great that we can speak of recovery. But the mortality is high except in the hands of surgeons with special experience in goiter operations, a fact that must limit the application of such treatment. There are also some theoretic objections that I think should be considered. Removal of part of the goiter in Graves' disease is not a radical operation. A mass is left which has the same morbid function. We know that the severity of the disease does not depend upon the size of the thyroid gland alone; also that a small part may enlarge. From these facts we can explain the relapses which sometimes follow operations. The best explanation at present of the good results after thyroidectomy is that the patient has temporarily a better chance to overcome the disease.

Doubtless mental impression plays a part, as it does in all other forms of treatment of exophthalmic goiter. Not being able to remove the cause of the disease, we must still combat the tendency even after operation. Operations are, I think, indicated in certain cases, especially those that do not quickly enough improve under medical treatment, or those that have large, unsymmetrical, and deforming goiters. But we should not be satisfied with the immediate success of operative treatment. Each case should be carefully studied with reference to its clinical features and the nature of the histologic changes in the extirpated gland. Pharmacologic studies would, perhaps, be of even greater value. With such cooperation and prolonged observation of cases, a great advance in our knowledge of Graves' disease and of the thyroid gland can be confidently expected, and the whole matter removed from the realm of conjecture where it is now obliged to remain.

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A CASE OF "NEURASTHENIA" AS TREATED BY
TWO GENERAL PHYSICIANS, ONE HOMEOPATHIST,
ONE QUACK, ONE OSTEOPATH, ONE PREGNANCY,
THREE OPHTHALMIC SURGEONS, TWO GYNECOLOGISTS,
ONE DIAGNOSTICIAN, ONE NEUROLOGIST, ONE
RESIDENT SANITARIUM PHYSICIAN, AND ONE REFRACTIONIST.

BY

GEORGE M. GOULD, M.D.,
of Philadelphia.

The wife of a regular physician of one of the Southern States consulted me last November, complaining of symptoms and giving a history to be described in the following pages. Her cure by means of simple spectacles seemed to both patient and husband so astonishing and satisfactory that I sent the following letter to Dr. S.:

Your kindest of letters is just at hand, and I hasten to ask you to recapitulate the entire clinical history of Mrs. S. Of course, I have interest in the individual case and cure, but you know it is the prevention of such cases which makes us eager to bring this knowledge to the world. There are thousands of such patients as Mrs. S. who have been vainly seeking relief, and dragging out lives of invalidism. In all Europe there is hardly any possibility of such cure to be dreamed of. Generally speaking, the profession, even here, either does not know, or in its prejudice denies, that the causes of such diseases may lie in the eyes. The greatest desire I have in life is to bring that knowledge to a practical recognition. To publish careful and accurate histories of cured cases is one of the best methods of reaching the ignorers and sneerers. Will you help me to do this in Mrs. S.'s case? No names will be published, as the object is not to bring any physician or person into notice, but only to teach the lesson. Please, therefore, state briefly the history and symptomatology, the physicians consulted, name them in order, their diagnoses, and reports, medicines and advice given, etc., up to the last. I will try to do no injustice to any. I wish to state that if

inquiries shall be made I will privately give your name to correspondents.

Chiefly from Dr. S.'s letters, I have put together the following notes of his wife's case. At the outset, in such instances, we have the old, old story that "the trouble began with a fall," a "box on the ear," "an attack of some illness," "going in swimming," "eating some green apples," etc. This time it was "jumping from a box," which occurred at the age of 12, and the patient's subsequent ill-health is ascribed to this cause. It was followed by backache and some other symptoms of relative unimportance. The backache continued until 1903. Menstruation beginning at 14, was always painful. Two general physicians, a few years after menophania, diagnosed retroversion of the uterus.

During all these years the patient was energetic and active, so far as her health would permit, but "from time to time would have attacks of complete exhaustion," with other symptoms, and at about the age of 20 one attack of this complete exhaustion lasted for a year. She was treated by the second of the physicians noted above.

The patient's brother was a homeopathic physician, and at the age 23 he sent her to a distant city to a famous, but very irregular surgeon, a wellknown quack indeed, who diagnosed retroversion, and, I gather, treated her chiefly by means of a pessary. There was "relief" so long as the pessary was worn. This instrument, however, after the patient's return to her home, "got misplaced and she became worse."

Another physician, a gynecologist, gave her several local treatments for the retroversion.

The osteopath now came for his turn, and "she received great relief."

Marriage occurred in the fall of 1902, followed by the birth of a child in August, 1903. There has been no physical retroversion since the labor.

In 1902 an ophthalmic surgeon examined her eyes and ordered glasses, and in 1904 another ophthalmic surgeon ordered other glasses.

The "attacks of exhaustion" etc., still continued, and the patient's husband took her to one of the most famous of American hospitals. The gynecologist in charge found no retroversion. "He cureted, and treated the urethral orifice, which was somewhat irritated." In addition, he advised that she should consult an excellent oculist of the city. The resident physician of the hospital did not carry out the orders of his chief and directed her to another ophthalmic surgeon who, after long and laborious tests, ordered glasses; but they greatly increased the intensity of all her old symptoms and added new ones. She was "an ideal patient," and continued to wear the glasses faithfully until she came to my office seven months later. The "attacks of exhaustion," severe occipital headache, etc., continued during this period; at times she was "unable to do anything whatsoever and was very nervous."

A leading consultant, in still another city, was next visited; he pronounced the awful word, *neurasthenia*, and ordered her to the great neurologist in another large and distant city. This great neurologist again solemnly repeated the mystic word, *neurasthenia*, and—did nothing.

To the Sanitarium the poor lady was now consigned. In charge, however, was a physician who had little pleasure and less profit in treating one mystery by another, and he had also known of cases of "neurasthenia" that had been proved to be due to eyestrain. Despite the words, *hysteria* and *neurasthenia*, he advised the patient to try a fourth oculist.

Patients with "spells," "nervous breakdowns," "fainting fits," "petit mal," "convulsions," "odd attacks," "strange lapses," "blind spells," "sinkings," "attacks of exhaustion," or whatever one of a hundred names is used, should prove of suggestive interest to live oculists. To the dead or "conservative" variety, and to the fashionable neurologist, as well as to the specialist in epilepsy, they are not interesting, except to apply a name to them, mutter the word *atypical*, and commend them to the mercies of Fate, of the Sanitarium, the private hospital, or the quacks.

The "attacks of exhaustion" in Mrs. S.'s case are, of course, atypical. Consciousness is not lost. She cannot speak during the height of seizure, there is no convulsive movement, no tremor, or trismus, no falling; it is not fainting as usually understood, although the head may fall over on the shoulder; during the attack she cannot move; the attacks are of different periods of duration and are easily produced by too great work or effort. They usually pass away with complete rest.

"Nervous breakdowns" arouse the attention of an alert oculist. One such attack lasted for a year in Mrs. S.'s case, and she has had many such of shorter duration. The last one, continuous for the seven months since wearing the glasses ordered before coming to me, has been the most unendurable. "She thought she would go crazy," my notes say; "her knees would knock together, and she would cry as if her heart would break." Occipital headache and pain in the back of the neck were at once added to the other symptoms previously existing and were peculiarly terrifying or productive of despair. Pain in the eyes was also a prominent complaint. With a naturally cheerful and energetic disposition, she has been slowly reduced to a condition of greater and greater invalidism, hopelessness, helplessness, and inability to do any work, reading, etc. Before the last glasses she "had some ability to resist and fight," but since then she "has been in despair and her sufferings have been worse."

I cannot say what lenses were ordered by oculist number one. Those of number two were:

R. + S. 0.25 — cyl. 0.75 ax. 90°
L. + S. 0.25 — cyl. 0.75 ax. 60°

Those of number three were:

R. + cyl. 0.50 ax. 180°
L. + cyl. 0.50 ax. 150°

I found the static error to be:

R. — S. 0.25 — cyl. 0.62 ax. 75° = 20/30 +
L. — cyl. 0.50 ax. 50° = 20/30 +

This is an error of refraction which in some cases might easily have produced head-tilting and lateral curvature of the spine. Neither existed.

I ordered:

R. — Sph. 0.12 — cyl. 0.62 ax. 75° } Distance and
L. — Cyl. 0.50 ax. 50° } constant use.

R. + Sph. 0.50 and Cyl. } Special for reading and
L. + Sph. 0.62 and Cyl. } nearwork.

In four days every symptom complained of for 16 years had disappeared. The vision had become perfect, i. e., 20/20 +; there were no "attacks," she could walk as far as she pleased, sit through church service, etc., things before impossible.

"Hysteria" (the superstition of the ages), the responsibility of supposed uterine disease for general nervous symptoms and pains anywhere and everywhere—all this is in this case admirably illustrated. In a given case functional diseases, ill-defined and varying sufferings exist; a cause must be found: a girl jumps from a box, is jarred, and symptoms are noticed. The connection of these symptoms with reading, writing, study, and school life is not noticed. A cause must be found, and the ancient fallacy is seized upon: a "retroverted" or "twisted" uterus is found, and lo! all is clear. That a thousand other instances, of jumps, or falls, of abnormal twist or version, produce no symptoms, does not matter. Several regular physicians treat the condition, resultlessly. A quack applies a pessary and "cures" it. But it comes back again. Then Quack Number Two osteopaths it, and he gives "relief," but the ghost returns. Pregnancy and labor end it, absolutely, but still the symptoms and the ill-health persist. At last a thorough-going and competent gynecologist is appealed to, and, in his own words, quoted from a letter to me, he says:

"Her doctors insisted that her womb was twisted, but I found a perfectly normal condition of all the pelvic organs. It was difficult to convince them, and I believe I never did convince them. You know how difficult it is to get the womb out of the head when it once gets there."

But the modern neurologists have long ago got the womb out of their heads! They may use the banal word "hysteria," but they smile scornfully at the rusty fallacy that hysteria has anything to do with *ιστρία*. This organ and this disease are not any more in the pelvis of the woman patient, not even "in her head." It exists in the heads of some of the experts. But they give the disease another name indicative of lack of nervous or mental power. But "neurasthenia," when closely analyzed and examined, is also finally found not to be the patient's disease. It exists "in the head"—of the neurologist. Certainly so far as therapeutics is concerned.

And the leading consultant, or diagnostician, when he echoes the fateful word "neurasthenia" also concurs in ticketing with a meaningless word a mystery without cause or cure.

The patient comes to us, and pays us for cure. Let us be serious about the matter, at least commercially honest. The patient pays us for doing, or trying to do, some good, not for impotent naming and "passing her on." Nor may we hide the glaring danger that the quacks and the irregulars are after us. In this case the work of two of these gentlemen was of no more lasting benefit than that of a dozen or more regulars, but it was only from them that there was "relief," however temporary. All our laboratories and our science, in many cases are of no more, and may be even of less, avail than the clinical acumen of ignorance and greed. We have lesson

yet to learn from the properly despised eddyites, osteopaths, and self-seekers.

The biographic clinic runs back through all the long and devious train of symptoms of 16 years, and, undeceived by the multitude of disguises assumed by the Proteus of functional disease, seeks to find the central and persistent cause. Nearly a dozen physicians found it to be a twisted uterus, but their treatments did not cure. Dr. Pregnancy cured every objective proof of retroversion and still the psychic retroversion, or hysteria, persisted. Three other great authorities said *neurasthenia*, but as this, like epilepsy, is a disease which it is supposedly folly to try to cure, the consignment to invalidism and sanitarium life is inevitable.

If the prescription of either one of the three oculists was correct those of the other two were incorrect and could only increase the sufferings of the patient. The only way to make the four oculists agree in their prescriptions, of a *mathematical* matter, recollect, is to establish a school of refraction in which the art of measuring the optical errors of the eye accurately shall be taught. The sole decisive question to ask is: Does ametropia sometimes and often result in disease? It is time to make an end of pooh-pooh and denial that such a question exists. If, in this case, for instance, the retroversion or the hysteria was the cause, the gynecologists should have agreed and cured. If the oculists were to blame, let them agree in their order to the optician. If the neurologists know no cause or cure for neurasthenia, let them be silent until they can either know, or do, or both know and do.

As to the result of correct glasses, the following paragraph from recent letters of the patient's husband may be of service. It is a physician, in good standing, who thus writes:

. . . since she has returned we have been rejoicing and thanking God for sending her to you. . . . I have spared no pains or expense to place my wife within reach of some of the best scientific men in this country, such as Drs. — (mentioning many), but I was only told "*neurasthenia*," which meant no more to me than it did to them. I knew that she had carried a retroverted uterus for years, which of itself could produce a train of nervous symptoms, but when this was corrected by a pregnancy two years ago, and, instead of improving she gradually grew worse, I knew that there was something overlooked. Having had glasses accurately fitted in —, this error did not enter my mind until I heard of Dr. — getting such relief at your hands. Then both of us "reached for a straw," like a drowning man. . . . for I realized that her life was going out gradually. . . . She has improved steadily each day since you sent her back to me, and no happier girl lives than she.

She continues to improve, and we continue to rejoice.

The so-called cranks of the profession are doing more for suffering humanity than any one else.

. . . only had one spell of exhaustion since she came home; before this they occurred almost daily. She is able to walk and do more than for years. She is very energetic and it is difficult to keep her in the limits of her strength. Your advice will help her.

Since she has worn your glasses the improvement in her appearance and health is apparent to every one. (January 4, 1906.)

The latest letter says:

My wife continues to improve; is able to walk more than she has done in years. (January 30, 1906.)

THE USES AND ABUSES OF THE FREE DISPENSARY.¹

BY

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of Philadelphia.

Much can be said on the subject of free dispensaries, both *pro* and *con*. The subject is one of great importance, as it has been estimated that probably half the population of New York and Chicago alone receive free medical and surgical advice in dispensaries.

So far as my own personal observation is concerned, four principal classes of patients patronize free dispensaries. They are: (1) Those able but not willing to pay; (2) those who, not knowing a specialist, want to find one without being compelled to pay a specialist's fee; (3) the poor, suffering unfortunates, who, either by drink, misfortune, ignorance, or poverty, are forced to avail themselves of a dispensary's charity; and (4) hypochondriacs, who find, or try to find, relief from their fancied ailments in the different departments of a hospital dispensary. For this class of people the dispensary furnishes a new variety of department store.

A certain proportion of the first and second classes will eventually go to the office or offices of the heads of the departments if the dispensary service is not to their liking. To the third class, the seedy, needy, and impecunious, the dispensary is a blessing. This class does not want to go to a city hospital and shrinks from becoming almshouse patients, be they ever so poor. For this class I heartily endorse the use of dispensaries. Even if they cannot always be cured, the dispensary services are a comfort and a help to them in their struggle for existence.

The fourth class consists of hypochondriacs, who furnish excellent material for experimental therapeutics and for the instruction of medical students and postgraduates in heart and lung examinations, whether physiologic or pathologic, eye-ground examinations, cystoscopy, passage of sounds, etc.

One of the most valuable adjuncts a medical school can have is a number of neurasthenics in its out-patient department. They are usually a tractable class and are willing to endure almost anything in the way of treatment, believing as they do that it is for the advancement of science or the cure of their fancied (?) ailment.

One possible reason for the abuse of dispensaries lies in the fact that it is to the interest of those connected with the institution to have, if possible, a large service. It means wider experience, it lends prestige and opportunities to do operations, thereby increasing the skill of the operator. Should the department be surgical in character, increased reputation as a surgeon, and consequently a larger clientele. The same will hold good in other departments of a hospital dispensary.

In hospital practice there is not quite as much risk for having possible legal suits for malpractice. In one of our wellknown local hospitals, a surgeon about to operate being asked what he was going to do, replied it was only a woman with a tumor who had no friends.

It is a noteworthy fact that the hospital or dispensary doctor usually gets practice more quickly than one

¹ Read at a regular monthly meeting of the South Branch Philadelphia County Medical Society, on May 26, 1905.

who has no connection with an institution. A physician who has no hospital or dispensary affiliations should try to obtain one. It will make him a better physician. Brain attrition is helpful to win success, one can swim more easily with the current, and to my mind the current today is with dispensary practice.

No one, I think, will deny that there are hospitals and dispensaries in the city today where there is absolutely no necessity for their existence. I understand that one large manufacturing establishment in this city has connected with it a dispensary and some twenty beds. Churches, too, for reasons best known to themselves, have been very prolific in organizing dispensaries.

Physicians of the commercial type, the sooner to acquire a reputation, also organize dispensaries. Of course the public takes advantage of these, as the public always will try to get something for nothing if it can, or for as little as possible.

A large factor in the use and abuse of dispensaries is that the public has found out, or thinks it has, that better treatment can generally be obtained there. It is a difficult problem to disabuse their minds in this respect.

Hospitals and dispensaries all over the country have today a larger patronage than ever. Formerly it was considered a sign of poverty, or at least humiliating, to go to a dispensary or hospital, but times have changed and so have the public, and so to say, like Boss Tweed, "What are we going to do about it?"

I have thought that it would be well if dispensaries were to have a registry of names and addresses in order to prove that the applicants for medical charity were worthy, although even then the patients could give false names and addresses, as they frequently do now in out-patient departments. There is certainly a large class of the general public who believe that they should have free medical and surgical advice, and the only reason for this attitude of mind can be traced to the existence of the many dispensaries.

Two of the large hospital dispensaries of this city have on their cards "For the poor only," but the majority of dispensary patients seem to care nothing as to what reads on the cards just so they get medical advice and treatment gratis.

I have seen in these out-patient departments, patients wearing diamonds, gold rings, and other jewelry, and have frequently requested that they give a contribution to the department, and when they consented, it was done grudgingly or they did not return for further treatment.

In the various departments of dispensaries I constantly see policemen, firemen, letter-carriers and other men earning easily \$80 to \$100 a month recipients of medical charity. I recall seeing a woman ring for a cab after having had a sore toe dressed. A physician connected with a down town hospital told me of a certain patient who applied for treatment stating that he was unable to pay one dollar a day. The hospital offered to take his case for four dollars per week, which sum he claimed he was also unable to pay. Later it was found that he was the owner of four houses, unencumbered. In another instance a contractor, with a large income, upon being refused treatment in the out-patient department of one hospital tried the following

day to obtain free treatment in another institution. At Johns Hopkins Hospital a story is told of a woman who, after being treated, lingered in the dispensary. "Is there anything further, madam?" the physician asked. "Oh, no, I'm just waiting till they've treated my maid." With some, it actually becomes a matter of pride. One of my own patients whose husband is quite wealthy confessed to me she dressed up in old shabby clothing to go to a hospital dispensary. One patient had five different dispensary cards for as many different institutions; and, being unable to read, handed all of them to the attending physician for him to pick out the particular card belonging to his dispensary.

Many instances might be mentioned of dispensary abuses, but of all I think the most abused dispensary charity is probably that connected with the eye. Patients with eye trouble will say they cannot afford to pay an oculist's fee, but who among us has not observed the gold-rimmed glasses they could easily afford without complaining of the cost, and in fact, be rather proud of it.

Yet the desire to get something for nothing is not entirely responsible for the abuse of the dispensary. It seems to me that practising physicians are somewhat to blame. There is a certain class of physicians who, either from incompetence, laziness, or because the fee is not sufficient, send cases of simple surgical operations to the dispensary, operations that they should be able to perform easily, and in this manner create the hospital habit in the patient. Many of these physicians furnish the after-treatment at their offices and pocket the fees. The patient, however, having found the dispensary a good place to go, will in many instances when he needs further medical aid, avail himself of the privilege, only this time without consulting his short-sighted physician.

There is also another side of the dispensary question in which the general practitioner does not fare so well. For example, a physician of my acquaintance had a patient who did not improve under his treatment, and coincidentally contracted another malady. Thinking a dispensary specialist would be more competent to treat this patient, the physician sent him to the out-patient department of one of our large hospitals. Later he received a letter from his patient to the effect that he could not afford to pay two doctors and was now going to the office of the dispensary physician he was referred to, who would also take care of him professionally for both of his diseases and thanking his physician for past services, I might say last services, for this is in all probability what the result will be.

There are also physicians who have the habit of bringing patients quite able to pay to the dispensary physician for a free consultation. It is often hard to refuse, for the sake of old acquaintance, perhaps; but, on the other hand, it robs the specialist of a fee and helps to swell the ranks of the dispensary patients.

The great majority of physicians cannot give their patients what they can get at hospital dispensaries, and it is often the doctor's fault, for many of us older members of the medical fraternity, in fact most of us, are simply not up to date on bacteriology and many other branches of medical science, and our patients discover our lack.

The role of the doctor, today, especially in our large

cities, is no longer that of the revered, intimate family counselor. I know of one family in which a dozen different doctors had been in attendance in one year, and when relief was urgent a dispensary specialist usually was called. A few weeks ago a patient came to me with a chronic disease of some six years' duration. He informed me I was the fifty-seventh physician that he had consulted in that period for his ailment.

Dispensary patients can go to the hospital and have a blood count made, their sputum examined, their urine tested for bladder, kidney, or urethral lesions, their skin diseases treated by the röntgen ray when necessary, and all for nothing, or at least a nominal cost.

Evolutionists believe the best and not the worst will survive and prevail, and this holds good in the medical profession. Physicians who are coming to the front today are well-educated young men who have had hospital and dispensary training, and who have confidence in themselves and the ability to prove their right to have it. They have reputations to make and this spurs them on. Reputation means success, although a doctor may have a reputation without being reputable. I repeat that a young physician with intellectual enthusiasm as an incentive, can do better work, and show better results with his cases than can be done in any dispensary where the work is often only routine.

To my mind most of patients feel, could they but find the right doctor for their ailment and had the money to pay, they would get along better in the hands of a private practitioner.

Nevertheless, while dispensaries continue to afford practice, experience, and reputation to young doctors, and old ones, too, for that matter, and "something for nothing" to the general public, the number of patients will not diminish and physicians will always be applicants for vacancies.

THE RELATION OF ACID FERMENTATION IN THE STOMACH TO NEURASTHENIA.

BY

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The study of neurasthenia is an important and fascinating one for several reasons. It is only too common, its pathology is none too well understood, and the treatment so often requires the maximum amount of patience, knowledge and good judgment. Probably a number of disorders are included in the term and will be more completely differentiated in the future, just as now appendicitis is no longer called inflammation of the bowels, nor psoriasis called eczema. It is owing to these facts that any light on the subject seems to me to be important and well worth the time spent on it. I shall attempt to prove what I believe to be either the direct or associated cause of a large percentage of the cases.

The association of an acid fermentation in the stomach with neurasthenia has been mentioned by Hayem,¹ Ewald,² and Herter.³ Those cases arising from great shocks, as railroad accidents, are not included in

the category. First we should consider what neurasthenia is. Osler⁴ describes it as a condition of weakness or exhaustion of the nervous system giving rise to various forms of mental and bodily inefficiency. The entire organism reacts with unnecessary readiness to slight stimuli, or, in other words, the body is in a condition of high irritability. Bartholow says, "It is a disease consisting essentially in an exaggerated susceptibility to bodily impressions and false reasoning thereon." Hughes calls it "a debility of the nervous system." Other writers have spoken of it "as an impoverished condition of the nerves," "a wornout condition of the nervous system," etc.

The definitions are for the most part suggestive of the clinical aspects of the condition and convey little idea of the pathology. The pathology that is usually described is more that of the associated or secondary conditions than the true disease. Moreover, I do not believe that the usual statements that the nerves are in a condition of under nourishment, that they are worn out, etc., are correct, for the following reasons: First, we would not expect any other kind of cells to be in a condition of increased irritability if worn out or impoverished in nourishment. Second, nerves do not become either more highly irritable or exhausted from stimulation, and we would certainly expect stimulation to use up the reserve force of any tissue. The reaction of a nerve after long stimulation is proved by this well known experiment. Pith the brain of a frog. The right sciatic nerve is exposed at the proximal end of the femur. A ligature is tied around the right thigh and passes under the nerve so as not to include it. This ligature must be tight enough to stop all circulation. Curare is then injected into the dorsal lymph spaces. If after a few minutes the left sciatic nerve is stimulated with an electric current the gastrocnemius muscle will not contract. However, if the muscle itself be stimulated it will contract. This shows the action of curare to be on the nerve endings as is well known. If the right nerve now be stimulated by interrupted current, the muscle will soon fail to respond to stimuli. It is in a state of exhaustion or tetanus. If the left nerve be stimulated in a like manner for two hours or even more, until the effects of the curare have worn away, then stimulation of the nerve causes the muscle to contract. This shows that it is the muscles that are fatigued and not the nerves. A current can be passed through a nerve which will kill it, but in that case a nerve will never again carry an impulse.

It might here be said that when a muscle is in tetanus through stimulation of the nerves, even if a current be applied to it directly, it will not contract. As in other cells, we would expect increased irritability to be caused by a change in the normal percentage of the substances that make up the tissue. The terms irritability, and irritation or stimulation, must be kept clear in considering these statements. The work done by Loeb⁵ and Zoe-

thout⁶ shows how the disturbance in the equilibrium of nerve elements increases irritability and what the cause of the increase is due to.

Dr. Loeb removed the gastrocnemius muscle from a frog. In the air, in oil, in mercury, in various solutions such as NaCl, KCl, sugar, urea, etc., there was no contraction. But if the muscle were first placed in an $\frac{m}{8}$ solution of some substance such as sodium citrate, sodium oxalate, potassium oxalate, or any one containing an acid radical which would precipitate calcium and then brought into contact with any of the first named substances, it would contract. Dr. Loeb calls it "contact irritability." The same results were obtained if the sciatic nerve were removed with the muscle and the nerve alone dipped into the solution of, for example, potassium oxalate, and then brought into contact with air, oil, etc. However, if the frog were first placed under the influence of curare before removing the muscle, this contact irritability would not be produced. This shows that it is precipitated calcium in the nerve or nerve endings that caused the contact irritability.

Zoethout says in his conclusions: (1) If the calcium salts in the muscle are decreased the efficiency of the K-ions to increase the tone of the muscle is increased. (2) If the K-ions in the muscle are increased, the efficiency of such salts as Na-oxalate and Na-citrate to cause contact irritability is increased. (3) The contact irritability depends (as Loeb suggested) on the normal ratio of salts in the muscle. Perhaps it is the disturbed ratio between the potassium and the calcium salts which makes the contact reaction possible."

The next step is to see what changes the percentage of ions in nerve tissue, and why the effects occur. It has long been recognized clinically that certain salts and organic compounds increase nerve irritability. Potassium salts have long been known to be very irritating to nerve tissue (Herter³); and ever since the historic work of Bouchard have been credited as the cause of convulsions in certain cases of uremia. This theory received a blow when certain investigators found that even after tying the renal vessels convulsions were not produced by large doses of potassium salts.

Following this work the cause of convulsions was laid to other substances supposed to be formed in the abnormal metabolism that takes place in grave renal and arteriosclerotic conditions. It is possible that the potassium salts are responsible for convulsions instead of the theoretic substances and that the reasons for the failure to produce them in experimental work is that there was a sufficient amount of calcium compounds in the nerve tissue to counteract the potassium action, while in uremic conditions for some unknown reason there is a deficiency of the calcium compounds. The next step in considering the results of a disturbed balance between calcium and potassium compounds is to see what evi-

dence we have of such an occurrence in neurasthenia. Caspari⁷ and Senator⁸ have demonstrated that in oxaluria there is always an increased elimination of calcium. In 38 urinalyses, in 33 patients, reported by Wesener, if the amount of oxalic acid excreted daily rose above .012 gm. marked symptoms of increased irritability appeared. In over 200 urinalyses in which there were present a large number of oxalate crystals, I observed well marked neurasthenic symptoms. In other analyses in which no oxalate crystals were present these symptoms were absent. We cannot draw too definite conclusions from the number of oxalate crystals present, as they do not always bear a definite relation to the amount of oxalic acid present, as pointed out by Wesener⁹ and Bunge.¹⁰ In these analyses I treated the urine with NaHCO₃ and CaCl₂ to precipitate the oxalic acid as the calcium salt. Time was given to allow good crystallization to avoid confusing the sediment with phosphates, etc.

Having noticed the effect of oxalic acid on the nerves I shall consider the origin of the acid in the human body. A small amount of the acid is eliminated daily through the kidneys. It was first demonstrated by Lehman¹¹ and Kuhne;¹² Baldwin¹³ gives the amount as being less than .01 gm. daily. According to Dunlop¹⁴ it is probably taken with the food, and this seems reasonable as it is contained in small amounts in tomatoes, tea, spinach, apples, strawberries and grapes and other foods. It has been proved that in pathologic oxaluria most of the acid comes from the acid fermentations in the stomach by Pfeffer,¹⁵ Zopf,¹⁶ Beilstein,¹⁷ and Begbie.¹⁸ The best known organism that causes an oxalic acid fermentation is the saccharomycetes, Hansenii (Jorgensen¹⁹). In a number of examinations of the stomach contents in cases of oxaluria I have observed a yeast that corresponds to the description of this one. Baldwin¹³ showed that by feeding dogs for weeks on excessive amounts of carbohydrates a gastritis could be produced that yielded oxalic acid. It may, however, be the end product of an abnormal metabolism (Weslie Mills,²⁰ H. Luthje,²¹ and Stradomsky²²). Also it is possible to derive the acid from uric acid through these steps. Uric acid plus H₂O gives alloxan and urea. The alloxan plus oxygen gives parabanic acid and CO₂. Parabanic acid plus water gives oxaluric acid and this plus H₂O gives oxalic acid and urea (Simon²³).

Gaglio²⁴ showed that oxalic acid is not destroyed in the body. This being the case, there must be some explanation why the amount of oxalic acid taken in with the food and excreted daily does not cause trouble. Undoubtedly much of that which is ingested unites with the calcium in the alimentary canal and is not absorbed, or if absorbed, is not able to cause any trouble. Part of the acid is evidently arrested in the liver, as Salkowski²⁵ has shown that 1,000 gm. of cow's liver contains .012

gm. of oxalic acid. Probably most of the acid that is absorbed as an acid or as the sodium salt unites with calcium in the blood before it reaches the important tissues, as the central nervous system. It is easy to understand that if the oxalic acid production is excessive, that along with other tissues the nerves would have to lose part of their calcium. Besides the protection offered to the nervous system by the purely chemical action of the blood and tissues there is one other important physiologic action. I refer to the selective action of cells in absorption and excretion. This is well seen in an experiment performed by Reed. He removed the colon from a dog and made a longitudinal section. He stretched the intestine across a petri dish, making places where the membrane touched the glass perfectly tight. He then poured serum from the dog into the dish on each side of the membrane, the epithelial side and the endothelial side. To the serum on the epithelial side he added cane sugar, urea, NaCl, peptone, glucose, egg albumen, etc. Only those substances which the animal body can use directly, such as the glucose and NaCl, passed through. After a while when the vitality of the membrane had been lost the cane sugar, urea, etc., also passed through. When the vitality of the cells is lost or lowered, substances will pass through them that will not pass through under normal conditions. The lowered physiologic activity of the cells and consequent loss of selective action explains why those who live a sedentary life and break the laws of hygiene are more subject to nervous breakdown.

As long as the stomach is in normal condition, there is only a small amount, or no fermentation. Ziemke²⁶ states that as long as the HCl in the stomach remains normal there is very little fermentation.

Any pathologic condition, as changes in the amount of HCl secretion, motor and absorptive functions, etc., predisposes to fermentation. Therefore, the first thing in the treatment of the majority of cases is to attempt to correct whatever gastric disorder is present. And this often means a treatment of splanchnoptosis, which is ably discussed by Moore.²⁷ The most important feature is a diet which will check the excessive fermentation. This means the exclusion of foods containing oxalic acid, as tomatoes and fruits and those carbohydrates which are easily fermented. Sweets, pastry, and sour articles, especially, are contraindicated. Milk, on account of the calcium it contains, is one of the best foods. Another feature in the treatment is to give something that will prevent the absorption, or if absorbed, to prevent the detrimental effect of the oxalic acid formed by the fermentation or ingestion. We have an ideal one in calcium hydroxid. First, the ingestion of an additional amount of calcium salts helps to supply the tissues with the element which is lacking. Then, too, the calcium combines with the oxalic acid in the alimentary canal forming an insoluble compound which in

all probability would not be absorbed. This, in my estimation, is one of the greatest features in the treatment. The action of the calcium is a certain one and it can be used in any condition of the stomach. Even if the fermentation does take place the oxalic acid produced is not absorbed, or if it be combined with calcium before absorption takes place, the nervous symptoms are not produced to any great extent.

Then, too, if hyperacidity be present, which it nearly always is in acid fermentations, the calcium hydroxid is of benefit in helping to correct that condition. If hyperacidity be present a dose of limewater should be given immediately after the meal and then another one, one to one and one-half hours after meals. In cases in which no hyperacidity is present the water does not interfere with digestion and the fermentation just about reaches its climax at that time. It does not seem that the fermentation can be stopped directly by the use of antiseptics. The milder ones are too weak to have much, if any, influence on the microorganisms, and if stronger antiseptics are used they would so irritate the stomach that a pathologic condition would be produced which would be very detrimental. For if the stomach is not entirely normal the fungi have much more chance to grow.

This, then, it seems to me, would exclude the use of antiseptics in the treatment. We are then limited in the treatment to other measures. To a certain extent gastric lavage is very useful. It removes a portion of the acids and large numbers of the microorganisms that are present. It also gives the stomach a much needed rest, both from often present overdistention and also from a continuous irritation of the foreign acids. I would suggest using it at night and as many times a week as seems to be necessary.

I would urge against the much too common use of strychnin in the treatment of nervous disorders of the neurasthenic type. It only helps to increase the irritability of the nerves and cannot "tone up the system" as is the popular idea of many doctors, as well as the laity.

In conclusion, I would state that I believe the field for investigation in gastrointestinal fermentations, in splanchnoptosis, and in arteriosclerosis is a very wide and interesting one and that these variously classed conditions are more closely connected than has been generally supposed.

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BACILLUS CHLORHYDRICI.

BY

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of New York.

Elsewhere¹ I have mentioned a microbe which I found in the gastric juice in hyperchlorhydria, and also when the hydrochloric acid was about normal. To my knowledge this microbe has never been described before; it is therefore new, and is of sufficient interest to be dealt with in greater detail.

This microbe is usually found in the gastric juice of man after an Ewald-Boas test-meal, and also on an empty stomach, when the free hydrochloric acid is at or above 0.1%; it also sometimes develops in the test-tube containing a similar solution of HCl and a piece of cooked meat or bread; but it is not found in hypochlorhydria when the HCl is below 0.1%. Very strong solutions of HCl are not favorable to its development; it thrives best in a solution of from 0.1% to 0.3%. Owing to the fact that it thrives in the presence of HCl I believe the most appropriate name for it is *Bacillus chlorhydrici*.

In a hanging drop in the mother fluid, *i. e.*, either the gastric juice or a solution of HCl and meat, it is, under the microscope, a small, slender, rod-shaped bacillus, having a slight motility. It requires an excellently trained eye to detect it with the dry system of the microscope, and this is probably the reason it has not been described by those who make a special study of gastric diseases. However, once attention has been called to it, it can be detected with the objective 7 and the ocular 3 of Leitz.

For diagnostic purposes the interest lies chiefly in the fact that when this microbe is present, it is additional proof of the presence of HCl, and that the case is not one of hypochlorhydria. This is especially valuable when for one reason or another the chemical examination is not conclusive.

Aside from this there is also a physiologic and pathologic interest which will be described later.

Cultural Characteristics.—It is extremely difficult to isolate this microbe from the mother fluid. In making cultures therefrom on the ordinary nutrient media, usually only yeast and fungi grow, and sometimes also *Sarcina lutea*. However, when the microbe in question is present in great numbers, and this is usually the case when there is some alimentary stasis, or when a solution of HCl and meat is kept in a test-tube for some days, it does appear in ordinary culture media. It never appears in cultures before the third day and sometimes it appears as late as the fifth or sixth day. By acidulating the neutral culture media with HCl its growth does not seem to be enhanced thereby in such

media. Once, however, it appears in the ordinary culture media, its culture in successive generations is comparatively easy. I have not succeeded in isolating it on gelatin in petri dishes, but have isolated it on plain nutrient agar in petri dishes. It grows at a temperature of from 30° C. to 40° C. It does not develop at low temperatures, and seems to be killed by a temperature above 75° C.

On agar in petri dishes in the first generation it appears, as said before, on the third, and sometimes only on the fifth or sixth day. The colonies have an amber color. They grow along the striæ made by the needle, forming grooves which they fill up; and they also form a few big separate colonies. The contour of the colonies is uneven and the surface is bosselated. The colonies which grow along the striæ are similar, only they are confluent and form slightly elevated bands of an amber color. They are not very moist and usually completely dry up in about 10 days after their appearance.

Under the microscope, the colonies are yellowish-red in the center, whereas the borders are slightly amber in color and are crenate, and present a flowery appearance, like that of a frozen window.

On agar slant in subsequent generations a few small colonies appear in 24 hours. In 48 hours slightly elevated yellowish bands form along the striæ of the needle, which bands have striæ transversely at regular intervals, evidently marking the juncture of the separate colonies which have become confluent. Soon the separate bands become confluent, and the whole surface is covered with a yellowish pellicle having short transverse striæ. In about two weeks it dries up, and one must detach part of the pellicle in order to obtain some of the cultures for examination.

In glucosed agar by stab the growth tapers down to a point and usually does not reach the bottom of the tube. A growth also appears at the upper part of the stab on the surface of the agar, which growth gradually spreads till it covers the whole surface of the agar, forming a thin, slightly yellowish upper layer, which does not dry up so fast as does the growth on plain agar slant, and hence is more convenient for preserving. It grows best, however, on glucosed agar slant by smear. In plain agar stab the growth is similar to the foregoing. *B. chlorhydrici* does not form cracks in glucosed agar, and of course not in plain agar.

In gelatin stab the growth is very sparing along the stab, but the surface of the gelatin is invaded in a few days with a yellowish, dryish cover having a somewhat wrinkled surface. The gelatin is never liquefied. Elsewhere on mentioning this microbe, I stated that it liquefied gelatin. This was an error, as the liquefaction of the gelatin was due probably to the extreme summer heat during which I had then cultivated the microbe in question.

Serum.—It grows on serum in small, slightly amber colonies at first, which afterward become confluent. Cultures obtained on agar from serum cultures have a pale amber color. It can also be cultivated on potatoes. It does not coagulate milk.

Morphologic Characteristics.—In the first and second generations on nutrient culture media it is a thin slender

¹ Medical Record, November 19, 1904.

der rod-shaped bacillus varying in length from 1.5 microns to 4 microns and in breadth about 0.2 microns or 0.3 microns. A few individuals may attain the length of 6 microns. Some individuals may assume the shape of oval oblong cocci and thus may give the impression of an impure culture, but it is not so. In the fifth and sixth generations some of the longer individuals assume a curved appearance. The edges are straight or slightly rounded in some of them. These microbes are slightly motile in the mother fluid, but in cultures they are very motile, in some cultures more so than in others.

Staining Characteristics.—They do not take the Gram stain and in general are not easily stained. They are not well stained with methylene-blue unless it is a very strong solution and kept on for about ten minutes. But they are more easily stained with dilute carbol fuchsin, violet of gentian, and also with eosin. Spores could not be detected in these bacilli.

Animal Experimentation.—Intraperitoneal injection of fresh cultures of this microbe into a white mouse had no effect on this animal. The ingestion of them by this animal had no effect either. By scarifying the root of the tail of a white mouse and rubbing in these microbes a small round nonsuppurating ulcer with a red bottom and sharply cut edges was formed, which healed in about a week. Such an ulcer, by the way, was also formed when yeast, which is usually found in the stomach, was rubbed into the root of the tail; but the ulcer caused by the latter seemed to heal more slowly.

Chemicophysiologic Action.—This microbe has properties in common with the yeast of the stomach. It would be best to deal with them in detail separately; we shall therefore briefly say here that they help the digestion of fats and proteids, and *B. chlorhydrici* can be used advantageously in the baking of bread, etc.

Pathologic Effects.—In isolating this microbe I surmised that it might in some way be the causative factor of ulcer of the stomach, and with this view I undertook its detailed study. But after careful consideration I must say that ordinarily this is not a pathogenic microbe, but a physiologic one, aiding digestion. Under adverse circumstances, however, this microbe, in conjunction with the yeast, may be an important factor in the causation of simple ulcer of the stomach. Indeed, it is hard to attribute the formation of a sharply circumscribed ulcer simply to hyperacidity, that is, chemical action. The latter could not possibly thus limit its action to a small spot, and, so to say, punch out such an ulcer; the lesions caused by chemical irritants are never so sharply defined. But *B. chlorhydrici* and the yeast of the stomach seem to form just such an ulcer.

When there is an inflammation or an abrasion of the mucous membrane of the stomach, owing to some irritant or injury, the germs mentioned can fasten themselves to such a spot and can, so to say, digest it, causing a small ulcer. This can especially happen in pyloric stenosis or in simple atony of the stomach, which conditions favor the multiplication of these germs, and they remain a long time in the stomach, in contact with its walls, unable to get out, as they usually do when the motility of the stomach is good.

It might be profitable to add that these two germs are the only ones which, as a rule, are found in the stomach when there is HCl present in the proportion before mentioned. Another microbe which sometimes makes its appearance in cultures from such gastric juice is *Sarcina lutea*. *Sarcina ventriculi* I have so far not seen in the stomach contents in this country, though it is frequently met, in Europe. *Sarcina ventriculi* appears in cultures in 48 hours and does not liquefy gelatin, whereas the sarcinae which grow in my cultures in this country appear on the fifth or sixth day, and they do liquefy gelatin, and have the characteristics of *Sarcina lutea*.¹ The latter is considered a harmless saprophyte, without any importance, and its appearance in cultures from the stomach contents is hardly of any significance.

THE SANATORIUM TREATMENT OF TUBERCULOSIS.²

BY

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The subject of tuberculosis, whether we consider it in respect to its prevalence or as a cause of death, is, indeed, of vital importance to the human race.

In the German Empire, in 1894, it caused more deaths than the five other most common infectious diseases combined, viz., typhoid, scarlatina, measles, diphtheria, and whoopingcough, and 90% of these deaths from tuberculosis were of pulmonary origin.

It has existed from time immemorial, probably since man first lived in houses. Hippocrates gave a classic description of its symptoms, but little was known of its true nature till about the middle of the seventeenth century, when the study of anatomy was really begun and autopsies were held whereby the knowledge of the lesions of disease was advanced. About a century later the tuberculous material was injected into living animals in which the disease was reproduced, thus demonstrating the specific and infectious nature of the same. The problem of the true nature of tuberculosis was solved, however, by Robert Koch within the lifetime of the youngest man present. He proved not only that tubercle bacilli were always present in the diseased structure and that they would grow outside the body, but also that a pure culture of the germs injected into a healthy animal would produce the disease in that animal.

Formerly, a diagnosis of tuberculosis of the lungs was almost equivalent to a death-warrant, especially if the patient was unable to go to a more favorable clime. This hopelessness was due in part to the lateness of the diagnosis; in part to improper treatment. But that some persons did recover from the disease was proved when autopsies became more exact and more general, for it was found that, on an average, 30% of those dying in hospitals of diseases other than tuberculosis had healed tuberculous lesions in the lungs.

Climate was formerly considered the essential factor in treatment, and all climates, even the Arctic, at least

¹ Macé, *Traité de Bactériologie*, p. 468.

² Read before the meeting of the Pennsylvania State Medical Society at Scranton, September 26, 1905.

for the summer months, have at various times been recommended. The results in the far North should be good, for in that region there is an absence of dust and pyogenic germs from the atmosphere, and there also can be had the greatest possible number of hours of sunshine.

On the other hand, some go so far as to contend that climate has absolutely nothing to do with the results of treatment, but I think a majority of observers agree that the comparatively dry atmosphere of elevated regions gives better results, other things being equal, than regions nearer sea-level. Certainly in a dry climate the outdoor treatment is not so uncomfortable as in a moist atmosphere, and, therefore, will probably be carried out more faithfully by the patient.

Sanatorium treatment gives the best results because the patient is under continuous control and nothing is left to the feelings or whims of the patient or his family. At home social, domestic, and business duties and attractions interfere with the exact carrying out of the doctor's orders by the patient, who in the incipient stage never feels sick enough to realize that his very life depends on his living the life of a desperately ill man, and who in an advanced stage, either has not the moral courage, the money, or the family support, aid, and comfort to carry out the prescribed regimen.

A word here as to the early diagnosis of pulmonary tuberculosis. Do not wait to name the disease till tubercle bacilli are found in the sputum. A recent writer in *American Medicine* has emphasized this point strongly and cites cases in which as many as 15 microscopic examinations were made before the bacilli were found. Their presence denotes the second stage of the disease, the stage of softening. Even without physical signs the continued presence of three symptoms is almost pathognomonic, viz.: (1) Progressive loss of weight and strength; (2) cough, and (3) elevation of evening temperature, usually with a subnormal morning temperature.

Osler says: "Arrest or cure of pulmonary tuberculosis is a question of nutrition and the essential factor is to improve the resisting forces of the body so that the bacilli cannot make further progress." The modern treatment aims to accomplish this, and is a tripod made up of: (1) Open air; (2) forced feeding, and (3) rest, or possibly it would be more accurate to say graduated exercise. The greatest of these is open air, and this makes possible the forced feeding; yet success will more surely follow when all three are carefully carried out.

The first tuberculosis sanatorium was founded about 50 years ago by Brehmer, of Germany, and to him is due this plan of treatment. Twenty years ago the Adirondack Cottage Sanatorium was opened with a capacity for nine patients, and for years was the only institution of its kind in America. Now there are at least 140 sanatoriums and hospitals for the treatment of pulmonary tuberculosis.

At White Haven, the details of treatment as laid down by Dr. Flick are followed, and the results are excellent. While the aim is to admit incipient cases only, many advanced cases do get in. There are so many applications that a wait of three months is usually

necessary after acceptance and, if the patient is very poor, he cannot, in the meantime, take proper care of himself, and must work so long as he can drag himself about. In consequence his disease often progresses rapidly. Then, again, his exact condition may not have been made out by the examining physician. This will be corrected now, as the new infirmaries have been completed and the new patient is not considered admitted to the sanatorium until he has passed at least a week in the detention ward, where he is thoroughly examined and watched. If it is found that his disease is too far advanced to be arrested in from six to eight months, he is sent home. This seems hard, and it is hard for the poor sufferer, but the principle of the greatest good to the greatest number must be followed. He is sent home not because nothing can be done for him, as much could be done, and at the same time society would be protected from this source of infection; but, as Dr. Flick has explained, while this is being done he is really taking the place of three or four less advanced cases, for it would take as long to arrest his disease as that of three or four incipient cases which in the meantime would continue to progress, possibly to incurability.

On admission, cases are classified as to involvement, on dismissal as to result. At Saranac Lake they are classed when admitted as incipient, advanced, and far advanced. The advanced cases are those in which either the symptoms or the physical signs are marked. The far advanced have both symptoms and physical signs marked.

This method is convenient, but hardly so accurate as that in use at White Haven. Here there are four classes: (1) One lung involved without softening; (2) one lung with softening; the presence of tubercle bacilli in the sputum is taken as the evidence of softening; (3) both lungs affected; (4) cavity formation.

Soon after admission the history is taken and the lung condition is graphically indicated on an outline chart on which tuberculous infiltration, rales, cavities, etc., are properly located. The urine and sputum are examined, the latter frequently if negative as regards the tubercle bacillus.

For the first two weeks the patient is on rest, that is, no work and very little exercise are allowed, and two hours of the afternoon must be spent in bed. At the end of this time, if the pulse and temperature are favorable, he is put on one hour of work a day, and, if a suitable case, this is increased five or even ten minutes a day up to eight hours.

This work is technically called exercise and consists of making beds, sweeping, scrubbing and other necessary work about the buildings and grounds, so that most of the work of the institution is done by patients.

Indeed, with exception of the chef and assistant cook, all the employes, the superintendent, doctors, nurses, housekeeper, tent-mender, plumber, stablemen and orderlies are tuberculous and most of them have been patients of the sanatorium and are still under treatment.

If at any time the temperature reaches 100° the patient is put to bed and kept there till the temperature comes down. The bed is at least a part of the treatment of practically all complications. As a rule medi-

cines are used only to meet indications as they arise with two exceptions. These are, that all patients use by inunction an iodized oil made up of iodine or eucalyptol dissolved in olive oil, and nearly all take a bitter tonic with pepsin.

Cough medicine is but little used, although a mixture containing ammonium, chlorid, aromatic spirits of ammonia, nitroglycerin, and a bitter is given to aid expectoration. In some cases creosote is given for considerable periods to benefit the cough and expectoration, but not as a specific for the disease.

Patients are taught that the cough can be controlled largely by will power, and that a cough which is not for the purpose of expelling sputum is useless. They are cautioned against swallowing sputum because of the danger of intestinal tuberculosis.

Anodyne cough medicines are rarely used as the cough is usually not much of a feature in outdoor patients. It was a matter of comment that at church where the patients attended in a body, they coughed less than the rest of the congregation. Nor are night-sweats troublesome to open-air patients.

For colds in the upper air tract inhalations of formalin are given. This is Dr. Flick's idea which the microbic origin of colds justifies. A few drops of the medicament are inhaled several times a day from a cotton-wrapped stick or paper funnel. It is not unpleasant if not held too close.

Hemorrhage is treated by rest in bed, liquid diet, ice to the chest, and nitroglycerin internally. For the common complication, pleurisy, the chest is cupped and painted with iodine; if this proves insufficient, a blister is applied or the chest is immobilized with adhesive straps. The blister is not broken, as the serum contains a certain amount of antitoxin which is absorbed back into the system. Ischio-rectal abscesses are opened and drained.

Tuberculous patients are very prone to digestive disturbances, but this is less evident in those undergoing the open-air treatment. Magnesium sulfate is frequently all that is necessary to correct "biliousness." It is often given in 0.65 gm. (10 gr.) doses hourly for several days.

The bell rings 10 times a day: At 6.15 a.m. the rising bell; at 7, the breakfast bell; at 8, the temperature bell; at 9, for lunch; at 12, for dinner; at 4, for lunch; at 5, for temperature; at 6, for supper; at 8.30, for lunch; and at 9, for retiring.

The daily allowance of food for each patient is six raw eggs, 12 glasses of milk, and a good dinner of soup, meat, vegetables, bread and butter, and frequently a plain dessert; in addition, he may eat a light breakfast and supper. Those on four hours or more work are given cold meat at supper. It is truly marvelous how much a sick man living in the open air can eat and digest if urged. Dr. Landis, one of the visiting staff, gives most of his patients olive oil instead of eggs, giving as much as one and a half ounces twice a day.

All of the time between 7.30 a.m. and 7.30 p.m. not otherwise occupied is spent in a reclining steamer chair in one of the kiosks. This is called "taking the cure." These kiosks are sheds with the entire south side open. They protect from the snow and rain and break the force of the wind. An army blanket, in addition to warm

clothing, enables the patient to endure the bitter cold of winter.

It is not enough to tell a patient to be out in the air as much as possible, for then he thinks he is following the doctor's directions when he walks and walks his life away, using up to furnish locomotive power the food and energy that should go to fight his disease. Any exertion whatsoever when the temperature of the patient is as high as 100° is injurious and in any case the amount of exercise should be watched and limited.

Chest protectors are not allowed and extra heavy underwear is not encouraged. Patients are not coddled but are out in all kinds of weather. Every morning a cold chest bath is taken and twice a week a full bath.

Some of the patients sleep in tents with all the sides up except in very cold weather when at least one end is open; others in shacks with three sides open from the height of the bed to the roof; the rest sleep in houses with windows open on at least two sides. Drafts are deliberately courted. Contrast this with the ancient heresy "avoid drafts." Compare this plan to that of olden times as told by Michel Peter:

I know of nothing more hideously fetid than the bedroom of a rich consumptive. It is a spot carefully enclosed where both air and hope are alike forbidden to enter; there are sandbags to doors; sandbags to windows; thick curtains envelop the bed where the unfortunate consumptive sweaters in perspiration and an atmosphere 20 times respired, 20 times already contaminated by contact with his own diseased lungs.

In taking histories it is wonderful how often the source of the infection can be traced. Some other member of the family, a room-mate or fellow-workman, some one with whom the patient was thrown into close and frequent company and who was not careful with his sputum, was so often tuberculous that one's belief in the communicability of tuberculosis could not help being strengthened.

A stay in a tuberculosis sanatorium not only confirmed old faiths, but new opinions were also formed. Outsiders expect to see a lot of pale cadaverous inmates sitting about coughing, spitting, and swapping symptoms and agonizing tales and details, when in fact one sees a crowd of happy, red-faced men, women and children working, attending school or sitting in the kiosks. They sing by the hour, usually the popular airs. Last Halloween they had a celebration in the general dining-room, originated and conducted entirely by patients. There were solos, duets, etc., accompanied by the piano. Those who took part and many others were masked or had blackened faces and fancy, mostly grotesque costumes. "Sunny Jim" was well represented by a woman patient and another one dressed as a Chinaman was down on the program as "Wun Lung."

True, on arrival, they are usually pale and solemn looking, but they soon become aware that they are not the only ones having trouble, and they learn how to be happy, though diseased, and after seeing so many go away apparently cured, hope is aroused.

Soon after entering the institution I was asked to examine a man about to leave with "disease arrested." He was fat, rosy, smiling. "Can this be a consumptive?" I thought. But there was present in his

lung a cavity that seemed to me as big as my fist. He had gained nearly 50 pounds during his six months' stay and he was going out knowing how to take care of himself, how to keep from giving others his trouble, and with the prospects of years of more or less useful life. If he had remained at home sitting by a hot stove, breathing in bad air and breathing out worse, drinking codliver-oil and whisky, and infecting those about him, his death would have been prompt, but his works would have lived after him.

Posted about the grounds is seen the legend, "If you spit on the ground you will be discharged." Each patient is supplied with a tin sputum cup, in which is a paper one. The tin is boiled daily, the paper burned twice daily. These are taken by the patient at set times from an outbuilding for this purpose, called the "Germery."

Paper napkins and handkerchiefs are the only kinds allowed. The patients are taught that these precautions not only prevent the spread of their disease to others, but also they are saved from infecting new spots in their own lungs.

A careful record is kept of the pulse, morning and evening temperature, and weight taken weekly at the same hour of day. There are happy faces when the scales mark an increase, and dejected looks when they show a loss, which is not often. One patient gained 14 pounds the first 14 days, and I know of two that gained almost 50 pounds in six months.

The amount of work a patient can do fixes his classification on discharge. There are four classes on dismissal also: (1) Not improved; (2) improved; (3) much improved; and (4) disease arrested. If he has not been able to do any work without adversely affecting his temperature and pulse, he is "not improved"; if he has been able to work between one and four hours a day, he is "improved"; if he has done as much as four hours a day, but less than eight, he is "much improved"; if he has done eight hours' work for four consecutive weeks, he is "disease arrested," and he goes home able to make a living and is a missionary spreading the gospel of fresh air and the cremation of all infectious materials.

The permanency of the results of this plan of treatment is interesting and important, but can be determined only after a number of years. Some encouraging data have been collected, however. Of the cases discharged from Saranac for from 2 to 17 years, 1,066 could be traced with these results: 31% were still well; in 6.5% the disease was still arrested; 5.2% were chronic cases, and 53.3% had died. The results as to the stage of the disease were about as would be expected; 66% of the incipient cases and 28.6% of the advanced cases had remained well, while only 2.5% of the far advanced cases were still well.

The total eradication of pulmonary tuberculosis is within the range of the possible and to make it more probable, institutions of three kinds should be established: (1) For incipient cases where practically all can be cured; (2) for advanced cases where a goodly percentage can be cured; (3) for far advanced cases where some can have their disease arrested and the remainder

given euthanasia, and all prevented from infecting others.

For the poor, sanatorium treatment is almost indispensable; for the well-to-do, it is advisable. The State must make provision for the poor, and in doing so is but looking after her own.

The duty of the physician is not only to preach the glad tidings of the curability of tuberculosis and to warn from the evil of his ways the sinner who spreads contagion by his promiscuous expectoration, but also to awaken the sleeping public to the fact that a third of those who die between the ages of 20 and 35 die of a preventable and curable disease, the great white plague.

DIGEST OF MEDICAL LITERATURE

CLINICAL MEDICINE.

DAVID RIESMAN

NORMAN B. GWYN

A. O. J. KELLY

BERNARD KOHN

HELEN MURPHY

THE ACTION OF ADRENALIN UPON TISSUES, ESPECIALLY THE ARTERIES.

BY

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of Philadelphia.

The widespread clinical use of adrenalin as a hemostatic, analgesic, or stimulant, to say nothing of its use for other purposes when the indications are not so clear, renders pertinent a brief summary of recent work bearing upon some of the untoward local and systemic effects of the drug. Although this is closely associated with the therapeutic aspect of the question, the indications for the use of the substance and its physiologic action in general are so well known they will not be discussed except as they bear upon the points mentioned. A sentence by Landis (*Progressive Medicine*, Vol. vii, No. 4, December, 1905) well states the opinion of many members of the profession: "Owing to the very extensive use of adrenalin I do not think too much publicity can be given to several facts, as there is reason to believe that more caution is needed in the administration of this substance than has hitherto been displayed." The facts to which he refers are the changes in arteries, to be mentioned later in this review. He quotes Floersheim and Hildebrandt as cautioning against the subcutaneous use of adrenalin, even in high dilutions, because of the danger of sloughing and gangrene.

Elliott (*Jour. of Physiology*, July 13, 1905) says the characteristic action of adrenalin is to stimulate muscle or gland cells activated by sympathetic nerves; without such nerve supply, plain muscle is unaffected by it. A positive reaction to the substance by any organ is proof of the presence of sympathetic nerves therein. Structures of the body in connection with sacral and cranial visceral nerves alone are influenced by it only as they are by any featureless poison.

Vaccari (*Il Policlinico*, April, 1905, pp. 158-165) advises against the use of adrenalin as a local ischemic when operating on the kidney, as it exaggerates the lesions of the knife. It may act in an untoward manner upon the cells, even to influencing their nutrition.

Drummond (*Jour. of Physiology*, xxxi, 81, 1904) found degenerative changes in the bloodvessels, desquamation and degeneration of the renal epithelium, and focal necroses of the liver as the result of injecting adrenalin chlorid. These were due to a direct toxic action of the substance and were in addition to the lesions, as congestion and effusions, due to the consequent increased blood-pressure.

Douglass (*Am. Jour. of Med. Sciences*, Vol. cxxix, p. 98, 1905), a clinician who is constantly using suprarenal preparations in throat and nose work, attributes to the use of these solutions certain unfavorable clinical results and says they are increasing rather than decreasing. These doubtful conditions are: Hemorrhage, reactionary symptoms, swelling and localized areas of edema, retarded healing, sloughing, and unhealthy condition of wounds. He then gives in detail the results of a long series of experiments to show the action of suprarenal preparations. His conclusions are that at least upon the lower animals they exert a tremendous influence upon the power of cell division on the development of protoplasm, on the movement of cilia, and on contractile tissue. In at least the first three the influence is distinctly harmful. Meltzer and Auer (*Ibid.*, p. 114) studied carefully the effect of suprarenal extract upon absorption and transudation. They found that intravenous injections invariably retarded both these processes; subcutaneous injections also often showed the same effect, but it was neither strong nor constant. This effect is explained by the assumption that the suprarenal substance increases the tonicity of the protoplasm surrounding the pores of the endothelial cells of the capillaries, thus narrowing the lumina of the pores and thereby interfering with the interchange between the blood and the tissue fluid.

Johnson (*Jour. Amer. Med. Assn.*, October 7, 1905, p. 1086) records the case of a man who, after receiving an injection of 1 to 4,000 adrenalin chlorid solution to check slight hemorrhage from the urethra, instantly developed alarming symptoms, resulting finally in total collapse for 10 minutes and inability to stand during a period of three hours. The condition appeared similar to an acute anemia. Barr (*Brit. Med. Journal*, January 14, 1905) reports collapse produced by the injection of 40 m. of a 1 to 1,000 solution of adrenalin into the pericardial sac after the evacuation of an effusion.

The action of adrenalin upon the bloodvessels of animals into which it is injected, to which reference is made by Landis, raises several questions, as for instance, the nature of arteriosclerosis and its cause, the effect upon the economy of diseased adrenals, and the possible damaging influence upon the arteries of the repeated use of adrenal preparations when administered for therapeutic purposes. A number of investigations upon this subject have appeared during the past year, the greater number including extensive histologic studies of the produced lesions. In most of them rabbits were employed, the adrenalin being injected into an ear vein at intervals of a few days for varying periods of time. Erb (*Archiv. f. Exper. Pathol. u. Pharmacology*, Bd. 53, H. 3, 1905) produced in rabbits extensive lesions of the aorta, including elevated atheromatous-like patches,

calcareous foci and aneurysmal dilations. The lesions in some cases extended to the branches of the aorta, the renal arteries showing the most marked change; in no instance did the process extend further than the hilum of the organ. Histologically, the first changes were in the muscle cells of the media, followed rapidly by calcareous infiltration and degenerative changes in the elastic constituents, resulting in decreased elasticity of the media. This was followed by compensatory thickening of the intima, but multiple aneurysmal dilations of the vessel walls resulted. The adventitia and vasa vasorum appeared not to be involved.

Ziegler (*Ziegler's Beiträge*, Bd. 88, H. 1, 1905) found in one rabbit, after six injections, necrotic foci in the media of the arch of the aorta and in the carotid and iliac arteries. There was superficial erosion of the tricuspid leaflets and a small calcific focus at the beginning of the coronary arteries; the heart was edematous. His general results were necrosis of the media of the large vessels, with calcareous infiltration and multiple dilations. The endothelium remained intact, though there was compensatory proliferation of the subendothelial cells of the intima. Ziegler regards the dilation of the aortic wall as due not to fragmentation of the elastica, but to the changes in the muscle. The function of the elastica is to preserve the flow of blood; its importance in adding strength to the vessel wall is slight. Lissauer (*Berlin. klin. Woch.*, May 29, 1905) found as the adrenalin produced arterial disease in rabbits, circumscribed or band-like upheavals of the aortic intima. The changes were in the media, and consisted of diffused calcific deposits, with marginal cell proliferation. The process begins in the muscle cells which become necrotic, and this is followed by stretching and transverse fracture of the elastic fibers and dilation of the vessel. The condition is wholly unknown in human pathology, though two lesions, namely, syphilitic aortic sclerosis and neurotic angiosclerosis, admit of comparison. Lissauer believes that in this adrenal sclerosis there is other than the blood-pressure-raising factor at work. It is very likely that the vasa vasorum play a part by interfering with the nutrition of the media. This explains the localization of the lesion in the media and also its limitation to large vessels, as the smaller contain no vasa vasorum. Regarding the ease with which the lesions are produced in rabbits, Lissauer states that herbivorous, much more than carnivorous animals, are inclined to develop calcification.

Scheidemandel (*Virchow's Archiv*, Bd. 181, H. 2, 1905) found changes similar to those described. He regards the stretching of the elastic fibers as primary, and the muscle degeneration secondary. The etiologic factors are mechanical and toxic. The process is different histologically from human arteriosclerosis, but there is no objection to considering these aortic changes as parallel to the calcification of the media in the arteries of the extremities in old persons. He suggests that as the development of arteriosclerosis extends over a lifetime in human beings, the treatment of animals with adrenalin should be greatly prolonged. Pearce and Stanton (*Trans. Asso. of Amer. Physicians*, Vol. xx, 1905, p. 513) regards the muscle change as older than that of the elas-

tica, and probably the primary lesion. The most striking feature of the late changes is the reparative process in the intima. Other lesions in the animals studied included enlargement of the heart, edema and congestion of the lungs, degenerative changes in the liver and kidney, and occasionally in the heart and skeletal muscles. These writers hesitate to express an opinion regarding the manner in which adrenalin produces these lesions. They consider the vessel changes as closely enough resembling those in man to justify the term "experimental arteriosclerosis."

Loeb and Githens (Amer. Jour. of the Med. Sciences, Vol. cxxx, October, 1905) studied the effect of various conditions upon the vascular lesions produced by adrenalin. These conditions included thyroidectomy, nephritis, and pregnancy. They also endeavored to determine whether the duration of the experiment, the number of injections, or the amount of adrenalin injected had most influence upon the final result. Removal of the thyroid gland did not prevent the toxic action of the adrenalin, nor was it apparent that the effect was more intense. The lesions were no more severe in the animals suffering from nephritis, which tends to show that interference with the elimination of adrenalin does not increase its toxic action. Injections did not interfere with the course of pregnancy in rabbits and exerted no effect upon the vascular system of the fetus. It seems probable that pregnant animals are less susceptible to the toxic action of the substance. This is contrary to the view of Nicholson, as stated by Norris (Progressive Medicine, Vol. vii, No. 3, September 1, 1905, p. 187), who says that "recent experimental work on the action of adrenalin upon the vascular system lends support to the view that the suprarenal secretion itself is the vasoconstricting principle, and that for some obscure reason it exerts an exaggerated influence upon the cardiovascular system in pregnancy." Loeb, however, speaks of the toxic, Nicholson of the vasoconstricting action. Loeb found that in determining the result of adrenalin injections in the rabbit, length of time is the most important factor, the number of injections much less, and the size of the dose the least important. The lesions, as those of other observers, were limited mainly to the aorta and to the media; inflammatory processes were never found. Although the histology is so different from that of atheroma in man, Loeb and Githens are not prepared to state how fundamental these differences are or whether they may not be even of secondary importance.

Wolownik-Charkow (Virchow's Archiv, Bd. 180, H. 2, 1905) studied the glycosuria and fall of temperature which followed the administration of adrenalin. This substance in a short time expelled glycogen from the liver. The decrease of temperature after injections was usually 1.5° to 2° C. It appeared 30 minutes after injection and was at its limit in 2 hours, disappearing at the end of 6 or 7 hours.

Josue (Gazette d. hôpitaux Civ. et Militaires, Oct. 26, 1905), who first demonstrated the effect upon animals adrenal injections, says it appears demonstrated that the suprarenal capsules and analogous glands which secrete adrenalin are able, when they bring into the circulation too large quantities of this active principle, to

determine anatomic lesions, atheroma, functional disturbance, and arterial hypertension. He concludes that certain cases of hypertension in human beings may arise from overaction of the suprarenals. Fordyce (Scottish Med. and Surg. Journal, Sept. 1905), in speaking of the relation of the adrenal glands to certain morbid processes, says it "does not appear that histologically any marked special reaction in the gland to infectious processes is observable. In acute virulent affections there are found acute vascular and cellular changes; in chronic affections, more long-standing changes. The theory of the secretion of lecithin by cortical cells is thus far utterly unproved." In connection with these results of adrenalin injections should be mentioned the findings of Kolisch (Sem. Médicale, Nov. 15, 1905, p. 549), who during two or three weeks injected phloridzin into the veins or under the skin of rabbits. In some of the animals there were afterward found opaline plaques on the aortic wall. In the media were homogeneous masses containing straightened elastic fibers. Kolisch states that all other substances, as adrenalin, elevating blood-pressure and causing lesions analogous to arteriosclerosis, contain the group NH_2 , to which their action has been ascribed; phloridzin does not contain this group.

Of the papers here abstracted, those referring to the arterial lesions produced by adrenalin are the most important, because of the several features included. All are of value in showing the power of adrenalin and the possibilities of diseased or overactive adrenal glands. None are sufficiently definite to suggest the discontinuance of adrenal preparations as therapeutic agents, but they do indicate that care in their use should be exercised until the function of the glands in the body and the effects of their active principles when administered are better understood.

PAROXYSMAL HEMOGLOBINURIA.

BY

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of Philadelphia.

As was to be expected, the work of the last few years on hemolysis and kindred subjects has brought this disease under consideration according to the methods of Ehrlich, as applied to this line of blood chemistry.

The old ideas as to the pathology of paroxysmal hemoglobinuria have been dropped *en masse*, and we readily grasp at a new idea which, in the light of the work on the subject, seems most rational and likely to stand criticism.

The etiology of the disease, its frequent occurrence after exposure, its recurrence on resuming occupation or on beginning active use of the muscle, suggests at once to the workers on the subject a blood toxin, of which the following possibilities are suggested: 1. That it is a toxin whose usual habitat was not the blood, but whose passage into the blood was determined by such factors as cold in the surface of the body or muscular exertion. 2. A toxin whose development in the blood was promoted by such factors. 3. A potential toxin, which acted only under the influence of such factors. 4. A combination of two or more of these.

As regards the toxin itself, it is suggested that it is an hemolysis, which may or may not be composed of two active substances—amboceptor and complement. Very little consideration is needed in overlooking the experiments to convince oneself that all theories as to this disease being an infection must be quickly disposed of; clinically, perfect pictures of the disease could be reproduced at will in active cases by merely allowing the patient to exercise or to expose himself to cold, and it is only with the serum and blood obtained during the paroxysm that reactions are obtained; “interval serum,” as they name serum taken during quiescent periods, is inactive. No infection has the power to appear and disappear in these short spaces of time, and the idea of a toxin being driven into the blood during the paroxysm or before, under inducement of effort or chill, seems irresistible.

The conclusions reached by the investigators (both in England and on the Continent) agree on the whole and in detail. They consider that their experiments prove that there is present in the blood-serum and lymph of “hemoglobinurics” a pathological substance which can dissolve (in vitro) the corpuscles of the affected individual (autolysis) and also those of normal individuals (isolysis), under suitable temperature conditions. These temperature conditions are important, lowered temperature favoring the hemolytic action. The observations of Ruziczka and Levadeti, the Ruziczka phenomenon, namely, the attacking of the red corpuscle by the phagocytes, due probably to the union of the intermediary body and the red corpuscles, is constantly noted in the hemolytic experiments of paroxysmal hemoglobinuria, though it is to be remembered that the intermediary body does not of itself bring about hemolysis.

EPIDEMIC CEREBROSPINAL MENINGITIS.

BY

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of Philadelphia.

As one of our most fatal of the infectious diseases, practically undetermined as to origin and presenting so many interesting clinical features, a bacteriological study of 130 cases of the disease should give some valuable results. Elser (Journal of Infectious Diseases, November, 1905) has in his examination of this number of cases done much to prove the value of careful bacteriology.

In 10 of 41 cases meningococci were demonstrated by culture in the blood of the general circulation; this as high a percentage as is usually found in typhoid or pneumonia, can only be considered as remarkable, and as showing what is to be expected with careful investigation, and the writer ventures to assert that—as with the other diseases mentioned—meningococci (general infectious) will be found just in proportion as accurate methods are used.

Ascitic fluid bouillon was the medium used in these cases, large quantities of blood being the main requirement, although the percentage of albumin in the mixture seemed important. The majority of examinations being taken after the second and third day of the disease, no

great aid if any, in diagnosis, was afforded and in such a fulminant infection as meningitis it is scarcely likely that any diagnostic help will ever be rendered; as regards prognosis, however, the finding of the organism in the blood means much more than the same happenings in typhoid or other septicemias, but 2 of the 10 cases recovered; 109 of the cases showed the typical organism, *Diplococcus intracellularis meningitidis*, either in cultures or in cover-slip preparation; 5 cases only revealed the organisms at autopsy; 16 were negative. Of extreme interest is the result of blood cultures in the disease, for since, in 1899, I isolated for the first time the meningococcus from the blood and joints of a case of meningitis, it has always seemed that, like pneumonia and typhoid, meningitis would be found to be a general infection with the tendency for the organism to attack certain tissues.

Quite as important as the detection of the infecting organism in the spinal fluid and blood is the search for the meningococcus in the suspected portals of entry, the nose and throat.

In many cases the organism is present early in the disease in these regions; it seems to be distinguished from other morphologically similar micrococci, particularly *Micrococcus catarrhalis*, and no result not confirmed by cultural proof should be accepted. One should remember that after the first few days the throat and nose may become infected from the passage of lymph from the brain.

From the fact that six fulminant cases showed lymphoid hyperplasia and thymus enlargement, the conclusion is made that this condition “constitutio lymphatica” may determine the rapidly fatal issue in many instances, and that a predisposition to infection exerts in such cases, the enlarged lymphoid structures favoring the lodgment of the organisms in the nasopharynx and their entrance into the system.

Glandular fever of children, or Pfeiffer's *Druesenfieber*, is more or less common in the United States, though it is looked upon in its true light as a mere symptom of a bacterial infection from the tonsils or nasopharynx. Heliodor Schiller describes a few cases (Jour. Am. Med. Assn., August 5, 1905) and reports that hypertrophic tonsils and adenoids are present in every case and that the organisms recovered from the tonsils are streptococci or influenza bacilli, or both, and staphylococci also in one case. Neuman has called it idiopathic swelling of the glands of the neck, and in certain epidemics in northern towns of this country it has been named glandular fever, as though it were a distinct disease of itself. The condition is of considerable importance, as it is sometimes very widespread and the glands may suppurate in exceptional cases. The course is usually mild, but occasionally there is a serious acute nephritis with evidence of involvement of the liver, spleen, and other organs. There may be obstruction of the air passages with severe dyspnea, and now and then this condition results fatally. It has been thought also that some of these cases are diphtheric, particularly as many occur during epidemics of diphtheria. These facts would indicate that there is no justification for the erection of a new class of diseases, much less a special disease, to cover a symptom common to many kinds of infection. The adenitis merely happens to be in the cervical region, but its etiology differs in no respect from buboes elsewhere. It is the business

of the lymphatic glands to do just this thing—corral any bacteria which may have gained an entrance into the lymphatic spaces. Even bubonic plague is of this type of infection, but the buboes were considered the main disease for a long time. All such cases of acute glandular enlargement should be designated by the name of the causative infection if it is possible to determine it—otherwise as a mere adenitis from unknown infection—that is, it must be regarded as a symptom or complication and not as the real disease. This way of looking at the matter may lead to an explanation of all other enlargements of the lymphatic glands now considered to be separate diseases of obscure origin. Perhaps a living cause may be found in some of them. Indeed, the curative value of röntgen rays in some of these cases points to a microbic cause—either vegetable or animal.

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Automobile deaths have a curious interest to the student of social conditions in that the rich are the victims as a rule. Of course, there are innumerable accidents to pedestrians, but they are not generally fatal. A writer who evidently tends to the collection of unusual statistics has tabulated seventy deaths of notable persons in the last three or four years. It is called the new peril to the rich and rightly, too, for the powerful machines have gone far beyond the limit of safety. So much concentrated power which can be released by the touch of a button is as bad as dynamite in the public highways. It has been suggested that the evil will soon rectify itself by the law of survival—all the reckless ones will be killed off in time. It is rather gruesome speculation, but there is much truth in it. Nevertheless it will take time to accomplish this result and avoidable accidents to the nonusers will continue unless there is some regulation. Our record is too bad entirely, but is on a par with that of our annual railroad list of deaths due to preventable accidents. The automobile smashup is one thing that the poor escape, a fact which should bring contentment to those of us who cannot indulge in this luxury.

Chicago Vital Statistics Once More.—The health commissioner of Chicago, moved by criticisms of his Bureau of Vital Statistics, recently referred the whole matter of local registration to the Chicago Medical Society. Several physicians, representing the best element of the medical profession in Chicago, consented to examine the classification of causes of death and the methods employed by the health department in the registration and tabulation of vital statistics, with a view to discovering defects and suggesting reforms. The report of this committee was very speedily completed and was adopted by the society on January 9, the recommendations of the committee being concurred in. That part of the report which deals with the registration of vital statistics is published in the Health Department

Bulletin for January 20. Concerning the reasons for the investigation the committee says "there has been more or less criticism regarding the vital statistics of Chicago, together with expressed incredulity as to the correctness of the mortuary statistics." The committee does not allude to any specific criticism or incredulity, nor say that any definite charge of inaccuracy or any particular expression of unbelief was brought to their attention, nor does the printed report show that any defects or inaccuracies were discovered, or that any improvements in methods or practice were suggested by the committee. The committee adopted unanimously a statement of its belief that "the health department is obtaining reports of and recording all deaths that occur in the city of Chicago, and is making accurate use of the same in the compilation of vital statistics." The health commissioner is highly pleased with the report of this committee. He says: "With this endorsement of its work and methods, the department will hereafter pay no heed to captious criticism or challenge of its vital statistics."

Statistics, Figures, and Facts.—*American Medicine* has no desire to take issue with the Chicago Medical Society on a question of vital statistics, but confesses a sincere desire to help the health department of Chicago out of an inveterate arithmetical confusion which has survived many changes of administration, and which evidently did not come to the attention of the committee, for the same preposterous illusion comes to light again in the bulletin immediately following that in which the committee's report is printed. In the bulletin for January 27 we are told that between 1869 and 1905 the average duration of life increased 138.7%. This statement is based on the following terms: The average age at death in 1869 was 13 years, 10 months, 28 days; the average age at death in 1905 was 31 years, 10 months, 1 day. If the terms are right the commissioner's percentage is wrong, but no one will dispute that if the terms are right the average age at death in 1905 was 129% greater

than in 1869. But the commissioner says that these figures show that the duration of life in Chicago has increased in the same proportion, and this transparent fallacy has been offered to the intelligent public of Chicago at least three times in the past year, and about as often in previous years. One must give the department whatever credit there may be in a sincere belief that such conclusions follow from such premises. Perhaps a circumlocution might bring the Bureau of Vital Statistics of Chicago to perceive that a rise in the average age at death does not signify a corresponding increase in the mean duration of life, but does signify an increased average age of the living.

The Statistical Chronicles of Too Dum and See Heer.—A former American consular agent tells the following story, whose details can be verified by anyone who will take the necessary trouble. We shall substitute modern chronologic and metric units for the ancient ones employed in the original records:

Many years ago, when Foo Chow became a city and organized an independent government, the official death certificate provided space for a singular piece of information. From that very early day until now the exact length of the left foot of every decedent has been recorded. In the year 2034 B.C., when Too Dum was Questor of Salubrity, there died in Foo Chow 6,880 persons. When the records were tabulated it was found that the sum of the lengths of the 6,880 left feet was 55,040 inches. The average length of the left foot at death was therefore $3\frac{1}{2}$ inches, and so it was recorded in his annual report by Too Dum. Year after year similar records were made, until, in the year 2020 B.C., the then Questor of Salubrity, Nu Shu, remarked in his annual report that the average left foot at death was growing longer in Foo Chow. This statement seemed to be of curious interest, but not very important. In the year 2001 B.C., however, Questor of Salubrity, Du Sum, reported that 21,216 persons had died in Foo Chow during the preceding year, and that the sum of the measurements of the left foot was 180,386 inches. The average left foot at death, in Foo Chow, in 2002, was, therefore, $8\frac{1}{2}$ inches long. Reviewing the vital statistics since the time of Too Dum, Du Sum found that the average left foot at death in 2002 was 141% longer than in 2034. This fact seemed to him important. It seemed to adumbrate pedal gigantism affecting the whole population of Foo Chow. Du Sum said this, and much more, in his annual report. The people of Foo Chow were agitated. Many believed that if something were not done to prevent it the Foo Chow foot would become monstrous. Inquiry among the oldest hatters revealed the alarming fact that the average Foo Chow head was no bigger than in 2034, and police surgeons testified that policemen were no taller in 2002 than in 2034. Inquiry among the shoemakers showed that a great many citizens living in Foo Chow in 2001 required shoes 12 inches in length, while in 2034, 33 years earlier, a shoe of that size was most unusual. The alarm increased. Thirty-six-inch shoes seemed but two generations ahead. Social order, domestic peace, commerce, industry, and art were said to be endangered. Profound gloom settled on Foo Chow. Only cobblers and tanners were pleased, and they combined into an exclusive guild, so that these trades became and still remain, as everybody knows, hereditary. But an Imperial Commission proposed definite measures to restrict the further spread of feet, and the Guild of

Tanners and Cobblers, seeing their monopoly threatened, plotted to displace Du Sum. They succeeded, and landed their own man, See Heer, in the Questorship of Salubrity. See Heer reviewed the vital statistics of Foo Chow for 30 odd years past, and he learned that while the average left foot at death had been growing from three and a half inches to eight and a half inches, the average age at death had increased from 10 years to 25 years. And See Heer said in his annual report that the age distribution of the dead in 2034 must have been governed rather definitely by the age distribution of the living in 2034, and the age distribution of the dead in 2002 must have been governed by the age distribution of the living in the year 2002. The population in the year 2034 must have been relatively larger under the age of 10 years than above that age. "At the present time," said he, "the proportion of the total population above the age of 10 years is far larger than it was in 2034; so much larger, indeed, that it has brought the average age at death up to 25 years." "I conclude, therefore," said See Heer, "that the average age of the living in 2034 was about 10 years, and that the average age of the living at this time is about 25 years. I am no longer alarmed, but on the contrary I consider it most appropriate that one should have larger feet at 25 years than at 10 years of age. My chief satisfaction in this conclusion is that it renders the recommendations of the Imperial Commission quite unnecessary, and my only regret is that the Guild of Tanners and Cobblers will not find their monopoly so profitable as they anticipated." The tanners and cobblers were enraged by this report, and they rested not from their vengeance until they had compassed the downfall of See Heer. But See Heer's reasoning convinced the plain people, and the only sceptics, beside the Imperial Commission and the Guild of Tanners and Cobblers, were a select few who had been trained to use the Rek Onur, a long forgotten implement, the progenitor first of the Abacus and later of the Slide Rule, and not surpassed by any modern device in the obfuscation of common sense. These persons said among themselves: "Du Sum is right and See Heer is a yellow journalist. The recommendations of the Imperial Commission are reasonable and necessary, for figures cannot lie. Moreover, feet are born, not made." So they wrapped the feet of their newborn babes in tight bandages, following the advice of the Imperial Commission, which said that the curse of big feet was imminent and obvious, while a possibility of functionless feet seemed remote and problematic.

When the bandaged feet of elect children became very distinctive, the results were pronounced satisfactory, and in the course of generations this custom having its root in a statistical vagary, became, as everybody knows, a hallmark of aristocracy throughout China. As the patient Boffkins wait for Sleary's babies to develop Sleary's fits, so the Foo Chow Smart Set still looks forward to a time when the big-footed plebeian will have only to stand on his head in order to sit in the shade.

The feeding and clothing of Swiss school children by public funds, as described by a correspondent of *The Lancet* of October 28, 1905, is a revelation of the tremendous strides being made in the direction of socialism in Europe. The matter is of considerable importance to American and English cities in which such a large percentage of little children are said to be as poorly fed as to be too hungry to study. One stand-

aghast at the statement that 70,000 New York school children are practically breakfastless, and that double this number in London schools are chronically hungry and never given a proper meal. To be sure the facts are occasionally denied in a half-hearted way, but as the matter will not down there must be some truth in the repeated assertions. If it is but half true, we can easily see that we are permitting the growth of a class of people for the next generation to support—if not in hospitals, then in jails, for it is difficult to imagine that these starvelings are to become good citizens. The proposition to feed these American children has come up for serious discussion in at least one city and has evoked a great outcry on the ground of its socialistic tendency. It has been pointed out that such schemes when tried in Europe have merely had the result of lessening home expenses. The children were deliberately deprived of what little they did get and the parents had a few more pennies for beer. It came to be considered a right. It is pauperizing even in Switzerland where the greatest safeguards are placed around the various schemes of school soup kitchens. Some men have come to consider themselves entitled to food and lodging as a reward for living. It is dangerous to relieve anyone of the struggle for existence—a struggle for which we are adjusted by a long inheritance and one which keeps us in health if we strive wisely. So there is much to be said against such means of relieving distress. We might be creating greater evils, yet the tremendous good being done in Switzerland seems to show that it is a modern practical means of improving the race.

The cause of the underfeeding of children of the poorer classes does not seem to have been sufficiently investigated. It is a sad fact that the parents, who are presumably of foreign birth, as a rule, are unable to support their own offspring. In their native lands, each child, as soon as able, is compelled to do its share of work toward the family support. Education is out of the question. With our laws against child labor, and compelling attendance at school, the family is deprived of the child's assistance for several years. It is a fact, then, as we have already shown in the case of the French Canadians, that it is not possible to raise the large families once so necessary. The whole problem is mixed up with this dreadfully complicated matter of the birth-rate. Yet, it is time to investigate still further and find out all the reasons. Society cannot afford to allow these little ones to grow up in dense ignorance and then give them a vote, which merely makes them stupid tools of dangerous demagogues. If our system of civilization thus disturbs the family economy found proper in Europe for ages past, we must substitute some assistance

to the heads of family or exclude them from their constitutional share of their sovereignty of this government. Both measures have been seriously discussed innumerable times, and each is so revolutionary that one recoils from advocating it—but something must be done. It is useless to blind ourselves to the fact that we are admitting to our civilization, hordes of people from entirely different forms of society, and there is lack of adjustment. The stream began but two or three decades ago, and we are already reaping the results. It is a wise man who can see the ultimate outcome or suggest remedies. Of one thing we are certain, if it is true that so many school children are not fed properly by their parents, it is essential to know the reason why this state of affairs exists.

The education of the unfit is another problem which has come up to bother our pedagogs and it is one which is bound up also in the great problem of underfeeding. There are so many men writing on this topic as to give the impression that we are attempting too much in our extensive educational schemes. It is now known that every brain has a limit beyond which it cannot be educated—a law as applicable to types of men as to types of dogs. Children, naturally, drop out of school at certain grades and those who are continued beyond their proper limit are merely injured thereby. Many a splendid mechanic has thus been educated into a poor preacher who half starves the rest of his life. It is now even hinted that many of our new types of immigrants are mere hewers of wood and drawers of water as their ancestors have been from time immemorial, and that any education merely unfits them for the battle of life. If all these surmises are true they are bound to shake the very foundation of our present order of things. The theory that there are minds now migrating to our shores which cannot possibly be trained into a condition fit for citizenship will naturally be resented by those who have built up our present school system to train men to equality. Yet it is time to stop and think a little. Every autumn the papers of the larger cities are much concerned over the inadequate school facilities and publish dreadful statistics of the thousands of pupils who must be placed on half-time, yet it has long been known that in London schools the half-timers who work half of each day, really progress faster than those who go to school all day. Have we not upset nature too quickly in our schools also? The mothers who cannot care for their children, send them to school not to be educated, but to get rid of them. In admitting them are we not already far on the way toward that socialism with its free lunches, which is so repugnant to American family independence? Whether or not we are educating the

unfit, it is quite evident that our lower grade schools are taking the place of the family. The feeding of the hungry among them is but a little step beyond. The dreadful physical condition of some of them must be remedied somehow and prevented in the future. Stewart Paton in his textbook on Psychiatry says it is the duty of physicians to warn against educating those unfit for it—most timely advice to which it would be well to give heed.

Investigations of Graft and Professional Morals.

—The recent investigations of the insurance companies and various other business enterprises have thoroughly convinced the public of the moral rottenness of the commercial world, and in his address as retiring president of the Syracuse Academy of Medicine, Thomas H. Halsted, taking up the question of divisions of fees among physicians, shows us that we, too, are not entirely free from graft. He believes that before joining the universal condemnation of the Standard Oil Company and of the insurance companies we should first do some house cleaning, so as to be ready to unite with the great mass of the general public in overthrowing pernicious systems destructive of character and morals. If dishonest methods are being practiced in dealings of doctors with their patients, or between doctors at the expense of the patient, then if we know this and do nothing to expose it, we shall surely suffer in the public estimation when the exposure comes, as come it must sooner or later. The discussion of or even a reference to this subject is a disagreeable duty, but publicity is the only way in which anything effective can be done. It is better that we take the initiative than that the public undertake it for us.

"The relation of a patient to his doctor is most intimate, and one in which implicit confidence is at the very foundation. The patient puts his life and his health unhesitatingly in his physician's hands. He feels that even if his doctor lacks skill in any emergency or needs assistance he at least is honest and will do what seems to him best for his interests. It would be a remarkable thing, considering the almost universal prevalence of 'graft' in the country, if some doctor had not devised a scheme by which he could take dishonest advantage of his patient and of his colleagues, and there does exist in our profession such a system. The scheme is that of dividing, without the patient's knowledge, the fee received by a surgeon, consultant or specialist with the family physician who has advised or procured the services of the former for his patient, the patient being allowed to believe that the fee paid the surgeon is for his services alone, inasmuch as his own physician collects his regular fee."

The Influence of Division of Fees on the Practitioner and Patient.—If the patient knew that there was division of fee there would be no dishonesty in such a transaction, but in many cases no doubt he might object to paying his physician what would seem to him

a large sum of money. It is true that general practitioners do not always charge fees commensurate with the services rendered, but the remedy for this lies in the organized action of the medical societies, and a general agreement to raise fees to a living basis. The dishonesty in the division of fees comes from the fact that the patient has relied upon the advice of the physician in selecting the most competent consultant. He assumes that his physician knows the best man, and without question accepts his advice. Did he know that his physician was considering, in addition to the consultant's medical qualification, the question as to how much of the fee he was to receive, the patient would likely feel that his doctor's advice might not be wholly disinterested. The practical effect of receiving a percentage of the fee is to cause, after several such experiences, a tendency on the part of such general practitioner to have more consultations, and give his consent to operations more freely than he otherwise might think necessary. The family physician should stand between the surgeon and his patient, looking after the latter's interests and using his judgment as to the necessity of an operation. He cannot permit his judgment to be influenced by financial consideration, and if he does, he betrays the patient who has placed his confidence in him. A man who permits himself to accept from such surgeon, consultant or specialist a division of the fee or a commission without his patient's knowledge, inflicts an injury on his character which sooner or later will tell on his reputation, because these things which cause a moral deterioration have a way of showing themselves unconsciously.

The Influence of the Division of Fees on the Specialist.—But the unfortunate effect is not limited to the general practitioner alone, nor is his patient the only one who surely suffers. To quote Dr. Halsted again:

"To begin with, the consultant is taking an unfair advantage of his colleagues, competing with them not on a basis of professional skill, character, and attainments, but he is secretly actually paying money to physicians to have their cases referred to him and diverted from his more ethical colleagues who expect recognition upon professional merits alone. This is a shrewd method of appeal to many men, even in our profession: a rapid method of getting lucrative practice, but it has its disadvantages. There is not the stimulus to do one's best work, practice comes too easily, and in time poor work tells on reputation. Such a man thinks too much of his fee, his judgment gets warped, and before he knows it he finds himself in the habit of wondering how much money he can get from the patient rather than what is best to do for him. He operates both when he should and when he should not, and the physician who has called him in consultation must frequently be in doubt as to how much reliance can be placed—will safety to the patient—on his advice. He makes of his profession purely a business, with the inevitable result of developing his money-making instincts at the sacrifice

of professional skill, acquirements, and judgment, and it can be but a matter of time until his reputation—one of the best assets of a doctor—is gone, and he finds that while he has been getting a practice, his slower, more honest competitor has been building on a surer foundation and has been establishing a reputation. The one has been deteriorating in his moral fiber from the beginning, the other has been strengthening his. So that, in the long run, it will be found that in our profession, as everywhere else, the old aphorism that 'honesty is the best policy' still holds true."

These ideas of Dr. Halsted seem to us worthy of thoughtful consideration. Undoubtedly there should be a change of proportion in the size of the fees of the average consultant and of the general practitioner who called him. Making all allowance for superior knowledge and experience and of years of training necessary to obtain it, the fees of many consultants are undoubtedly exorbitant; on the other hand, the general practitioner is often poorly paid. But the best remedy does not lie in a system of graft worthy of politicians. The consultants could do much to remedy the situation, and without damage to their own pockets, by being more considerate of the patient's financial condition and the position of his professional brother. He should use his influence not only to give a patient confidence in the ability of a worthy and faithful medical attendant, but to lead the patient to a true appreciation of the value of the practitioner's services. The general practitioners can do much to help themselves by uniting, as has been done in several places throughout this country, to raise the fees for their services until they receive fair compensation and a living income.

The food of the Japanese sailor is described by Surgeon-General Suzuki,¹ and the details are of considerable importance for several reasons. Formerly beriberi was quite prevalent in the navy and it was thought to be due to a diet deficient in nitrogen. A more liberal or European diet was substituted for that in which rice was the chief ingredient, and the disease certainly marvelously decreased. There is but little said as to any sanitary improvements made at this time, and we can only presume that the underfed are more susceptible to this infection, particularly those suffering for nitrogen. As explained by Wright,² proper means to prevent infection by the bacillus he has discovered as the cause will prevent the disease irrespective of the diet. Nevertheless, the idea is still quite prevalent that the well fed will escape infection to which the starved quickly succumb. The other point brought out by Suzuki is that the Japanese, considering their diminutive size, are quite as well fed as the American soldier, if not a little better. Omitting the numerous substitutions permis-

sible in each service, the following table shows the ounces of the staple articles:

	Japanese.	American.
Bread	13	18
Rice	12	1½
Barley	4	0
Meat	7	20
Vegetables	15	16
Sugar	1½	8½
Fruit (dry)	0	1½

It is presumed that the 7 oz. of meat includes the bone as in the 20 oz. of American service, but the lack of nitrogen is made up by that in the 16 oz. of barley and rice. All the talk about the little Japanese accomplishing wonders of exertion on a handful of food is baseless—they require fuel like any other machine. Indeed it is a mistake to consider them a rice-eating nation, for they are grain eaters, like ourselves, rice being a luxury of the cities and too expensive in the interior. So far as nitrogen is concerned, they are better fed than Chittenden considers necessary—and properly so, if it has really helped to end the disability from beriberi.

The syphilitic origin of tabes has so long been accepted by the profession that it would require nothing short of a pathologic revolution to change the opinions of the majority. A history of infection can be obtained in so many cases—some say 90%—that it is generally presumed to be present in the other 10. In spite of this presumptive evidence, which would otherwise constitute remarkable coincidences, there are signs of a beginning revolt, chiefly on the ground that so few syphilis develop tabes. Indeed, it has been boldly stated that syphilis is no more responsible than any other exhaustive disease, presuming, of course, that syphilis, even if treated, does in some way cause physiological poverty of a sort. If these recent suspicions are based on evidence, it is considerably more than a question of pathology, for it has serious social complications. A diagnosis of tabes is practically an announcement that the patient has had syphilis. If he could have developed the tabes from some other cause, he is unjustly suspected and may suffer unwarranted consequences. It is unwise to combat the revolt by the old data but to investigate anew, now that there is a fair presumption that the cause of syphilis has been found. There is urgent need of some new generalization by which all the numerous diseases due to or followed by fibroid changes can be grouped together. We have too long dismissed them as the results of alcohol or syphilis. The former is losing its position as a cause, chiefly from the experiments of recent years, and yet there is an alcoholic history in a respectable percentage of cases. Perhaps the power of syphilis has been unduly magnified and it may suffer a

¹Journal Association of Military Surgeons, November, 1905.
²American Medicine, December 16, 1905.

similar fate in spite of the present overwhelming circumstantial evidence. Perhaps all fibroid changes are results of some acquired or congenital tissue inability to stand the ordinary stresses of life or its accidental strains. Family histories might clear up the matter. The suggestion is worthy of some thought at least.

BOOK REVIEWS

Enlargement of the Prostate, Its History, Anatomy, Etiology, Pathology, Clinical Causes, Symptoms, Diagnosis, Prognosis, Treatment, Technic of Operations, and After-treatment.—By JOHN B. DEEVER, assisted by ASTLEY PASTON COOPER ASHHURST. Philadelphia: P. Blakiston's Son & Co., 1905.

The subtitle of this new work by Dr. Deaver indicates the scope of the monograph, which forms a worthy addition to the vast literature on diseases of the prostate. While the work of others on the subject is freely used, the author has given his own views without reserve; his experience in prostatic surgery, while relatively less than with the appendix, is nevertheless sufficient to permit him to speak with no small degree of authority. We cannot here speak of the 12 chapters separately and will mention some of the general points only. The nonoperative treatment of enlarged prostate receives considerable attention; the opinion of the author is that every patient should have a trial of catheter life, as only a trial can determine who will thereby be benefited. The Bottini operation is discussed at length, with the conclusion that it is applicable to an extremely limited number of cases; it is an operation that only specially trained operators should undertake. In discussing the choice of operation for the radical treatment, Dr. Deaver insists that no surgeon should limit himself to one method, though he prefers the suprapubic route as a rule. Considering it the preferable route for total enucleation of the prostate, he believes there are cases in which that organ is best removed through the perineum. He also sounds a note of conservatism in operating by any method. As a whole, the book is a judicial discussion of the subject in question and will prove of almost as much value to the physician as to the surgeon. It is well written and well printed. The illustrations, many of them original, are very good. The paper and binding is exactly like that of the same author's recent work on appendicitis; our opinion of this style was expressed in the review of that book.

Manual of Pathology, Including Bacteriology, the Technic of Postmortems, and Methods of Pathologic Research.—By W. M. LATE COPLIN, M.D. Fourth edition, rewritten and enlarged. With 495 illustrations and 10 colored plates. Philadelphia: P. Blakiston's Son & Co., 1905.

Though this manual follows the same general plan as the third edition, the revision has been so thorough that the entire book has been essentially rewritten. It now contains 948 pages of text, but owing to increased width of page and slightly smaller type, the book is thinner and much more convenient to handle than was the older form. The only important change from the old style is that general laboratory technic has been placed in an appendix of 50 pages. The author still believes in the great value of illustrations in illuminating the text and hence their number is considerably increased; a few of them should be replaced, as Nos. 165 and 171, for not well showing the tumors described, but as a whole they are exceptionally good. A new feature of the book is the insertion of voluminous references to the literature

of the subjects discussed, and colored plates of the blood and of the malaria parasite have been added. The book is easily foremost among recent publications as a well-written, accurate, comprehensive, and thoroughly up-to-date manual of pathology. Some parts, particularly those dealing with special pathology, are possibly rather heavy for students, but the clearness of the statements very largely counteracts this tendency. The book can be confidently recommended to either student or practitioner.

A Manual of Organic Materia Medica and Pharmacognosy.—By LUCIUS E. SAYRE, B.S., Ph.M. Third edition revised, with Histology and Microtechnique by WILLIAM C. STEVENS. P. Blakiston's Son & Co., Philadelphia, 1905.

This book can be heartily recommended, especially to students of pharmacy. It is accurate, sufficiently full, and takes a broad comprehensive view of the subject.

Operative Surgery.—By JOSEPH D. BRYANT, M.D. Fourth edition. New York and London: D. Appleton & Company, 1905.

The medical profession needs but little information from the reviewer regarding this standard work except the statement that a new edition is available. It has been entirely revised and largely rewritten and printed from new plates. The two volumes now contain 1,527 pages, exclusive of a comprehensive index, and 1,793 illustrations. Although the text is very clear and explanatory, the numerous illustrations make the book specially valuable, particularly to the younger surgeon and the general physician who occasionally does surgical work; for the latter classes we can hardly imagine a better guide. This edition will be found thoroughly abreast of surgical progress in technic, and in every way sustains the deservedly high reputation of its predecessors.

BOOKS RECEIVED.

[Prompt acknowledgment of books received will be made in this column, and from time to time critical reviews will be made of those of interest to our readers.]

Materia Medica. 1906 edition. Part II. E. R. Squibb & Sons, New York.

Surgical Treatment of Chronic Suppuration of the Middle Ear and Mastoid.—By SEYMOUR OPPENHEIMER, M.D., Otolologist and Laryngologist to Gouverneur Hospital, etc. Illustrated by 46 half-tone plates containing 64 figures and 27 key plates, all engraved from original drawings prepared from special dissections under the supervision of the author. P. Blakiston's Son & Co., 1906.

Materia Medica, Pharmacy and Therapeutics.—By SAM'L O. L. POTTER, A.M., M.D., M.R.C.P. (Lond.); formerly Professor of Principles and Practice of Medicine in the Cooper Medical College of San Francisco, etc. Tenth edition, revised, and in greater part rewritten. P. Blakiston's Son & Co., Philadelphia, 1906. Price, cloth, \$5.00; leather or half morocco, \$6.00 net.

Christianity and Sex Problems.—By HUGH NORTHCOTE, M.A. Crown octavo, 257 pages. Bound in extra cloth. Price, \$2.00 net. F. A. Davis Company, Philadelphia, Pa.

The Physical Examination of Infants and Young Children.—By THERON WENDELL KILMER, M.D., Adjunct Attending Pediatricist to the Sydenham Hospital, etc. Illustrated with 59 half-tone engravings. 12mo, 86 pages. Bound in extra cloth. Price, 75 cents net. F. A. Davis Company, Philadelphia, Pa.

Twenty-first Annual Report Bureau of Animal Industry for the year 1904. Government Printing Office, Washington, 1905.

Practice of Medicine.—By JAMES TYSON, M.D., Professor of Medicine in the University of Pennsylvania, etc. Fourth edition, revised and enlarged. With 240 illustrations, including colored plates. P. Blakiston's Son & Co., 1906.

An Atlas of Human Anatomy for Students and Physicians.—By CARL TOLDT, M.D., Professor of Anatomy in the University of Vienna, assisted by ALOIS DALLA ROSA, M.D. Translated from the third German edition and adapted to English and American and international terminology by M. EDEN PAUL, M.D., Brux., M.R.C.S., L.R.C.P. Part VI, Neurology, the Organs of the Senses. Figures 1,124 to 1,566 and index. Rebman Company, 1904.

AMERICAN NEWS AND NOTES

GENERAL.

Cubans Fear a Quarantine.—Representatives of steamship, railroad, and commercial interests of Cuba visited President Palma to solicit his intercession with Washington against threatened quarantines at gulf ports. After a consultation with the Cuban health officers, President Palma will instruct Minister Quesada. He is again urging the Congregational leaders to press the pending appropriation for general sanitation, so as to leave no ground for criticism.

Federal Control of Milk.—Federal supervision and inspection of the nation's milk supply, including farms and dairies, is urged. It is presented as a means whereby the consumers would be assured absolutely pure milk. The whole system of milk production and distribution is declared to be wrong and to attempt to obtain a pure product by means of pasteurization or sterilization is claimed to be rank nonsense so long as there is no government control of methods. As regards State food commissions, inspectors are usually mere politicians who will inspect anything in any way a farmer or dairyman wants him to. Professor C. F. Lane, assistant chief in the dairy division of the United States Department of Agriculture, declares the department has under advisement the question of Federal supervision of the milk supply.

International Medical Congress.—The arrangements of the American National Committee have now been fully made. Those men who have planned to present papers at the congress should at once send abstracts of their papers to the secretary-general of the congress, Dr. Miguil Bombarda. These abstracts should be very short, and should simply outline the scope of the paper. The official delegates from this country have been appointed by Secretary of State Root, and are: L. S. McMurtry, Louisville; John H. Musser, Philadelphia; Frank Billings, Chicago; W. W. Keen, Philadelphia; Nicholas Senn, Chicago; F. A. Shattuck, Boston; R. Matas, New Orleans; Albert Vander Veer, Albany; Walter Chase, Boston; E. DeWitt Connell, Portland, Oregon; Ramon Guiteras, New York City. At the congress an orator will represent each country in delivering an address or oration before the assembled sections of the meeting. Nicholas Senn will represent this country as orator, and will deliver an address on "The International Study of Carcinoma."

EASTERN STATES.

Child Labor and Women's Working Hours.—The most important measures before the Massachusetts Legislature, thinks the Boston Post, are those for the suppression of child labor and the restriction of the hours of employment of women in factories. "There must be a strengthening of the statutes, more ample provision made for their enforcement, greater power given to the officials charged with the work of protection, if Massachusetts is to maintain the place of leadership which she has taken in this great reform."

Boston Mortality Report.—The number of deaths reported to the Board of Health for the week is 261, as against 217 the corresponding week last year, showing an increase of 44 deaths, and making the deathrate for the week 22.87. The number of cases and deaths from infectious diseases is as follows: Diphtheria, 59 cases, 6 deaths; scarlatina, 13 cases, no deaths; typhoid fever, 6 cases, no deaths; measles, 191 cases, 2 deaths; tuberculosis, 45 cases, 34 deaths. The deaths from pneumonia were 50; whoopingcough, 8; heart disease, 26; bronchitis, 7; marasmus, 5. There were 11 deaths from violent causes. The number of children who died under 1 year was 41, under 5 years 63, persons over 60 years 63, deaths in public institutions 72.

NEW YORK AND VICINITY.

The Harvey Society Course.—The eleventh lecture will be delivered by Professor J. C. Webster, of Rush Medical College, at the New York Academy of Medicine, on March 8, at 8.30 p.m. Subject: "Modern Views Regarding Placentation."

Apartment House in New York for Physicians Only.—The attempt made in New York to colonize physicians under one roof and set aside a building for their use has proved a great success, an apartment house at Fifty-eighth street and Madison avenue containing 70 physicians, whereas a year ago, when the plan was put in effect, there were only 16. This is the only building in that city occupied solely by physicians. A self-constituted board of five physicians—original tenants in the building—pass on the qualifications of each applicant for room. The applicants are all specialists. The majority of them are from New York, but there are some from Yonkers, Long Island, New Rochelle and other points.

A Too Enterprising Patent Medicine Man.—Charged with sending threatening and defamatory postal cards through the mails, "Dr." George A. Soden, a Newark physician, was held in \$1,000 bail by United States Commissioner Jones last Saturday night. Soden has been managing the affairs of a patent medicine concern and offered premiums to children for the distribution of the goods. According to the Post Office Inspectors, consignments of pills were sent on credit, and if not returned or paid for at the end of a stipulated period, the Eureka Law and Collecting Agency and the National Law and Collecting Agency, two concerns which, it is alleged, Soden also controls, would send a "reminding" postal card which, it is alleged, was so strong in language that the United States grand jury found the indictments which led to the physician's arrest. Soden says that if any offense was committed it was purely technical, and that he would not intentionally violate the provisions of the law.

PHILADELPHIA, PENNSYLVANIA, ETC.

Scarlet Fever Epidemic.—An epidemic of scarlet fever exists at Meadowbrook, Montgomery county. One death has resulted, and there are a score of developed cases.

Smallpox at Bryn Athyn.—The three smallpox patients in the Swedenborgian colony at Bryn Athyn are improving. No further cases are anticipated and as a result of general vaccination within ten days the quarantine will be lifted.

Jersey Homeopaths Hear Addresses.—The winter meeting of the West Jersey Homeopathic Medical Society was held in Camden last week. Papers were read by Professors O. S. Haines and William W. Speakman, of the Hahnemann Hospital, Philadelphia, and Dr. J. M. Henson, of Boston.

Medical Work in the Schools.—The report of the medical inspectors of the Philadelphia Bureau of Health for the month of January on the inspection of schools shows that the inspectors examined 27,403 pupils. Treatment was recommended in 4,483 cases. There were 1,561 pupils excluded, and of these 802 were readmitted. There were 277 children vaccinated.

Drug Appeal a Record-breaker.—The three associations of druggists which C. G. A. Loder alleged formed a Drug Trust, and from which he secured a big verdict on the charge that they injured his business, have appealed to the United States Circuit Court of Appeals. The record in the case is the largest ever filed, there being no less than 2,074 closely-printed pages, including testimony and the charge of the Judge. The appeal will cost nearly \$5,000.

Cleanliness of Cars.—Chief Abbott, of the Health Bureau, held a conference with Charles O. Kruger, general manager of the Philadelphia Rapid Transit Company, in regard to keeping the street cars in a sanitary condition. He was assured by Mr. Kruger that every street car is now swept clean at the end of each trip and that the floors of the cars are cleaned each morning with a 3% solution of carbolic acid.

New cases of typhoid to the number of 276 were reported to the Health Bureau for the seventy-two hours ending at noon Saturday. This is 36 in excess of the number reported for a similar period last week. The part of the city most affected includes the wards which receive water from the Delaware river direct. Chief Medical Inspector Cairns said that typhoid fever would continue until the water-supply is filtered.

Free Antitoxin.—In the few months that the system of free distribution of the diphtheric antitoxin throughout the State has been in force, the State's deathrate from that disease has been reduced almost 80%. This means that instead of claiming 420 lives out of every 1,000 children or adults afflicted with the disease, diphtheria now gets only 88 victims out of 1,000.

Must Stay to be Cured.—Judge McMichael, of Philadelphia, has refused the petition of Frederick Spang to be liberated from the Pennsylvania Hospital, where he is undergoing treatment for the drug habit. The young man, who is a member of a wealthy Pittsburgh family, voluntarily submitted to be sent to the institution several months ago, and sought his discharge in order to go to Florida.

Suppression of Quacks in Philadelphia.—The Medical Jurisprudence Society announces that, at a special meeting to be held March 19, an address will be delivered by Mr. Andrews, the official counsel of the New York County Medical Society, upon all phases of that organization's movement against quacks in New York City. It is hoped to initiate similar action against such culprits in Philadelphia.

Fewer Lives Pay for Coal.—The report of Inspector P. M. Boyle, of the sixth anthracite mining district for 1905, shows the number of fatal accidents was eight less than in 1904. The number of tons of coal produced per each fatal accident inside in the mines in 1904 was only 92,841 tons, whereas this year the production per life lost has been increased to 107,676 tons, an increase in tonnage per fatal accident of 15,245 tons.

Killed 25 Tuberculous Cows.—Twenty-five of the fine milch cows at the Winslow, N. J., Dairy Farms, owned by Samuel G. Rosengarten, of Philadelphia, were killed by order of State Tuberculosis Commissioner Kitchner, as he had found that they had tuberculosis. All the product from the 60 head of cows kept on the Rosengarten farm has been marketed in Hammonton, and Manager William H. Robinson announces no more milk from the cows on the dairy will be sold. Consequently a milk famine for the present time is looked for in the town. The killing of the cattle was witnessed by a large crowd of people. Representatives from several Boards of Health were present, and autopsies were performed which proved that the cows were actually affected with tuberculosis.

SOUTHERN STATES.

Smallpox.—A case of smallpox appearing at the New Castle County Workhouse, Delaware, a quarantine of 14 days has been declared.

Denies Charges of Brutality.—Dr. William A. White, superintendent of the Government Hospital for the Insane at Washington, replies to the charges of brutality and ill-treatment of patients contained in the

report of the committee of the Medicolegal Society, denying that the so-called "bull-pen" was what it was represented to be, and declaring that the Medicolegal Society was striving to destroy the confidence of the public in the institution.

Health Board Demands Clean Cars.—The Board of Health of Wilmington, Del., recently passed resolutions calling upon the street railway companies to clean their cars more frequently and asked the street and sewer directors to suppress the running of flat-wheel cars and cars with jolting trucks.

The Pure Food Bill.—Professor Edward Kramer appeared at the pure food hearing of the House Committee on Interstate and Foreign Commerce and spoke at length of the chemical nature of benzoic acid and benzoate of soda, the preservatives most commonly used by manufacturers of pickles, preserves, and condiments. He expressed the opinion that these preservatives are not harmful in small quantities.

Mobile Yellow Fever Quarantine.—"Quarantine—which in this instance means detention and inspection—goes into effect against Havana and all Cuban and other tropic ports on March 1," was the statement made this week by Dr. Rhett Goode, health officer of the city of Mobile. All vessels from Havana will be detained at quarantine station for inspection, the length of time to be determined by the health officers at the quarantine in Mobile Bay. Through passengers and freight are not affected.

Mortuary report of New Orleans for the week ended Saturday, February 17, 1906: General diseases, 37; diseases of the nervous system and of the organs of sense, 16; diseases of the circulatory system, 22; diseases of the respiratory system, 28; diseases of the digestive system, 8; diseases of the genitourinary system, 12; diseases of infancy, 6; diseases of old age, 3; external causes, 9; total deaths, white, 76; colored, 61; total white and colored, 137. Deaths in hospitals and other institutions, 38; deaths certified to by the coroner, 18; deathrate per 1,000 per annum for the week, whites 16.13, colored 36.04; total white and colored 21.39.

Will Vaccinate the Cattle.—The Delaware State Board of Health is taking steps to stamp out anthrax in case the disease appears among the cattle of the lower end of the State. Two years ago the disease so affected the cattle that hundreds of horses and cows were killed to prevent an epidemic. The legislature reimbursed the farmers whose stock was killed and provided for the purchase of vaccine and the employment of veterinarians to ward off a recurrence of the disease. Supplied with this vaccine, Dr. J. R. Kuhns, of Kent county, will vaccinate the cows in the vicinity of Bowers' Beach and elsewhere in that section, in the hope that the disease will not appear the coming summer.

WESTERN STATES.

Mortality and Birthrate of Michigan During January, 1906.—The total number of deaths returned to the Department of State for the month of January was 2,968, representing a total deathrate of 13.6 per 1,000 population, as compared with a rate of 12.4 for December. There were 544 deaths of infants under 1 year of age, 181 deaths of infants aged 1 to 4 years and 943 deaths of persons aged 65 years and over. Important causes of deaths were as follows: Tuberculosis of the lungs, 209; other forms of tuberculosis, 24; typhoid fever, 46; diphtheria and croup, 63; scarlet fever, 18; measles, 19; whoopingcough, 27; pneumonia, 288; diarrheal diseases of infants under 2 years, 44; influenza, 39; cancer 135; accidents and violence, 150. There were no deaths reported from small-

pox during the month. The total number of births reported to the Department of State during the month of January was 4,032, representing a birthrate of 18.4 per 1,000 population. While the registration of births for the first month of the operation of the new law requiring immediate registration has been extremely satisfactory, there were several districts that made no report for the month. However, the number reported for the month exceeds the number reported for the same month last year under the old law by 830, the rate for January, 1905, being 14.9 per 1,000 population.

Chicago Plans Great Hospital.—It is said that the erection of a palatial hospital for wealthy Chicagoans is assured by the contribution of \$352,000 to the building fund of the Presbyterian Hospital. With this amount and with additional money which it is expected will be raised, the board of managers of the hospital propose to build as an annex to the present hospital a pavilion which is to be the finest hospital in the West. The new hospital is planned for the exclusive use of Chicago's wealthy men and women, who are to procure there all the comforts and the luxuries they would secure at their homes. Work on the new pavilion will begin this spring. It is the intention of the managers of the Presbyterian Hospital to make the "pavilion" support the clinics and the charity patients to be taken care of in other departments of the hospital.

CANADA.

Typhoid Fever at Montreal.—Practically an epidemic of typhoid exists in the districts of St. Henri, St. Cunegonde, Westmount, St. Denis, and Maisonneuve, adjacent to Montreal. With a combined population estimated at 76,500, they have a total of 208 cases. In the districts surrounding Montreal accurate information is difficult to procure. The health authorities do not make public the number of cases reported. If the system of reporting was as thorough as most cities no doubt many more cases would be recorded. The cause of the fever is attributed unofficially by the doctors to the water supplied by a suburban water company.

FOREIGN NEWS AND NOTES

GENERAL.

Plague in Russian Army.—According to a recently published report of General Linevitch on the sanitary condition of the Manchurian army, there are 220 cases of Siberian plague. The total number of sick in the hospital is 744 officers and 14,282 men, of whom 1,584 are suffering from contagious diseases, including 612 cases of typhus fever.

Plan to Make Children Immune.—Prof. Emil von Behring has announced his determination to adhere to the resolution which he promulgated in Paris, of keeping his tuberculosis remedy secret until autumn. He discussed his method of preventing tuberculosis by immunizing milk cows. His theory is that children fed on milk from cows rendered immune through his treatment become themselves immune.

Personnel of the Japanese Red Cross Society.—The personnel employed by the Japanese Red Cross Society was, according to the *Sei-I-Kwai Medical Journal*, as follows: Directors, 5; chief surgeons, 6; surgeons, 347; pharmacutists, 168; clerks, 191; assistant pharmacutists, 6; chief female nurses, 239; chief male nurses, 110; chief stretcher-bearers, 8; female nurses, 2,026; male nurses, 643; stretcher-bearers, 144; temporarily employed chief female nurses, 9; temporarily employed chief male nurses, 2; temporarily employed female nurses, 607; temporarily employed male nurses,

472; making up 4,978 persons in all. Up to the end of September the Society had expended 516,000 yen. It has exhausted the greater part of its fund, and it still has to pay 10,000 yen for services rendered during the war.

OBITUARIES.

Lewis D. Bierber, aged 61, February 26, at his home in Easton, Pa. He was graduated from the University of Pennsylvania in 1867. He was a veteran of the Civil war.

Edwin Geer, aged 41, February 25, from blood poisoning, at his home in Baltimore. He was graduated from the College of Physicians and Surgeons, Baltimore, in 1891.

Alfred Catellier, aged 37, February 17, at his home in Berlin, N. H. He was graduated from Laval University; medical department, Quebec, in 1891.

Charles McDonald, aged 81, February 21, from heart disease, at his home in New York. During the Civil war he served in the Confederate army.

John P. Burwell, aged 53, February 16, from heart disease, at his home in Washington, Va. He was graduated from Jefferson Medical College in 1880.

Jacob W. DuBois, aged 70, February 19, at his home in Millersville, Md. He was graduated from Bellevue Hospital Medical College in 1865.

John Williamson Palmer, aged 81, at his home in Baltimore, Md.

THE PUBLIC SERVICE

Changes in the Medical Corps of the U. S. Navy for the week ended February 24, 1906:

F. W. TYREE, acting assistant surgeon, detached from the naval training station, San Francisco, Cal., and ordered to the naval recruiting station, Kansas City, Mo.

Changes in the Public Health and Marine-Hospital Service for the week ended February 21, 1906:

M. J. ROSENAU, passed assistant surgeon, detailed to attend meeting of committee of American Bacteriologists in New York, N. Y., February 24, 1906, relative to the standardization of tetanus antitoxin serums.—**DUNLOP MOORE**, passed assistant surgeon, relieved from duty at Yokohama, Japan, and directed to proceed to Honolulu, Hawaii, reporting to chief quarantine officer for duty.—**D. H. CURRIE**, passed assistant surgeon, department letter of July 27, 1905, amended so as to grant Passed Assistant Surgeon Currie twenty-one days' leave of absence from July 18, 1905, instead of two months.—**J. T. BURKHALTER**, passed assistant surgeon, granted seven days' extra leave of absence from February 24, 1906.—**C. M. FRISWELL**, acting assistant surgeon, granted twenty days' leave of absence from February 14, 1906.—**E. B. HALLET**, acting assistant surgeon, granted five days' leave of absence from February 19, 1906.—**F. TOWNSEND**, acting assistant surgeon, granted seven days' leave of absence from February 21, 1906.—**M. WALERIUS**, pharmacist, department letter of January 30, 1906, amended so as to grant Pharmacist Walerius thirty days' leave of absence from February 8, 1906, instead of February 15, 1906.

Board Convened.—Board of officers convened to meet at the Bureau, February 27, 1906, for the purpose of making physical examination of an officer of the Revenue Cutter Service. Detail for the board: Assistant Surgeon-General W. J. Pettus, chairman; Assistant Surgeon J. W. Trask, recorder.

Appointment.—Albert J. Nute appointed acting assistant surgeon for duty at Port Huron, Mich.

SOCIETY REPORTS

THE SOUTHERN SURGICAL AND GYNECOLOGICAL ASSOCIATION.

Eighteenth Annual Meeting, Held in Louisville, Ky.,
December 12, 13, and 14, 1905.

[Specially reported for *American Medicine*.]

[Continued from page 267.]

Surgical Treatment of Cancer of the Head and Neck, with a Summary of 128 Operations Performed upon 110 Cases.—GEORGE W. CRILE (Cleveland, Ohio), in a paper on this subject, presented general conclusions to the effect that since the head and neck present an exposed field, cancer here, unlike that of the stomach, the intestines, or even the breast, might be recognized at its very beginning. That every case was at some time curable by complete excision; that the field of regional metastasis was exceptionally accessible; that cancer rarely penetrated beyond the extraordinary lymphatic collar of the neck; that the growth tended to remain here localized, and that by freely utilizing all the modern resources of surgery, and by applying the same comprehensive block dissection as in the radical operation for breast cancer, the final outcome in the surgical treatment of cancer of the head and neck should be not only as good but even better than that of almost any other portion of the body.

Wandering or Aberrant Retroperitoneal Fibroid Tumors of Uterine Origin.—I. S. STONE (Washington, D. C.) stated that these tumors must reach the space behind the peritoneum by way of the broad ligament. This route was the only one open and was necessarily followed by every fibroid which escaped into any part of the retroperitoneal space, however remote. After a fibroid became well separated from the uterus it usually remained in the broad ligament indefinitely, and would always do so unless other tumors developed in the uterus and were forced to follow directly in the same channel as the one preceding. It would be observed that single tumors were generally found in the broad ligament and the development of others must occur before we could have the variety we were studying. Many subperitoneal tumors were seen, and few, indeed, had been noticed where the tumor had lost all connection with the uterus. Such growths could not become parasitic and receive their nutrition from some other source, as did the intraperitoneal wandering or parasitic variety. He had no experience with a single wandering tumor behind the peritoneum which had entirely lost its uterine connections, and believed such development an impossibility for the reason mentioned above that a *vis à tergo* must exist. The movement of these tumors was therefore directly opposite to that of the intraperitoneal variety, for the latter must have either movable organs to assist in their progress or else traction, a result of adhesive contact, must aid in the lifting or elevation of them upward in the abdominal cavity. He reported two cases illustrating the variety he described in his paper. Both of these had grown to very large proportions. In the first, the largest tumor was very high in the abdomen and was entirely separate from all former uterine connection, including its blood supply. The presence of a large wedge-shaped middle portion was sufficient proof of the mode of development. It had forced other growths both upward and downward, acting as a wedge between the two. In the second case the central portion of the specimen was made up of many small tumors which had appeared to force the larger growths in opposite directions, as in the first case. The largest growth was highest and was completely separated from the uterus and the tumors below, except by a small amount of connective tissue and its anterior peritoneal cover. The pelvic tumors in both of these cases were firmly impacted, and in the second case it was impos-

sible to release the specimen without injury to deep and unseen vessels, which resulted in fatal hemorrhage. The first patient made a fairly satisfactory recovery and was now able to attend to her duties as housekeeper.

Goiter, With a Report of 182 Operations Upon the Thyroid.—CHARLES H. MAYO (Rochester, Minn.) said that surgery of the thyroid was increasing. Operations were as satisfactory as any made, giving relief with brief disability. In 50 years the mortality had fallen from 40% to less than 3%, Kocher's being 2%. Accessory glands, like branchial cysts, were more often found in the lines of hypoplastic inversion. The lymphatics served as ducts. Total extirpation was followed by cachexia in from 50% to 70% of cases. Graves' disease was probably due to an over- or perverted secretion, the gland showing a general or local condition of cell activity. The great majority of enlargements in young people responded to medication. Part of the benefit obtained in the removal of the sympathetic was from cutting the lymph channels draining the thyroid. During the past 17 years the Mayos had operated upon 182 thyroids, with 9 deaths. Of these, 57 were cases of well-marked Graves' disease, with 7 deaths in all, and but 1 in the last 23. Of these cases, 50% made an early recovery; 25% did so during several months; the remainder were improved, but had occasional relapses of a temporary nature. Among the remaining 125 operations representing cysts, colloids, parenchymatous and 5 malignant tumors, there were but 2 deaths, one from pneumonia, the other from tracheal collapse on the third day following extirpation of a carcinomatous goiter. Cocain was used in 13 cases, but ether anesthesia, preceded by morphin and atropin, was the rule. The head was maintained in the high position. The incision was usually transverse.

The Diagnosis of Renal Calculus.—GUY LEROY HUNTER (Baltimore, Md.) took up the subject from the general relationships, first considering the various other maladies of the kidney from which nephrolithiasis must be differentiated, and then discussing the diseases of other organs which might mislead the diagnostician. The röntgen ray and the wax-tipped bougie were considered invaluable aids in the diagnosis of renal calculus, but they both failed at times, and the importance of the urine examination in all suspected kidney cases was emphasized. Several cases were reported to illustrate the difficulties of diagnosis.

Requirements and Qualifications for a Successful Career in Surgery.—The President, LEWIS C. BOSHER (Richmond, Va.), selected this subject for his address, and said among other things, to the recent graduate in medicine no department of his chosen profession appealed with the same force as did surgery. While a student he had been impressed by the brilliancy of the results secured by his professors before his very eyes; at the meetings of the alumni the clinics in surgery were crowded, while those in other branches were usually either slimly attended or else attended as a complement to the individual holding them rather than from actual interest in the subject. In most medical colleges the prominence of the professors of surgery in all faculty affairs was well known; while, considering the more material side of the question, he had little trouble in ascertaining that it was no unusual thing for a surgeon to secure for a single operation, occupying but an hour or two, or even less, a fee greater than the entire collections of the general practitioner for a week's steady work with broken rest and with cares and responsibilities innumerable. On leaving college, if he entered into hospital service, these facts were impressed on him with even greater force, and later on, having himself entered the ranks of struggling practitioners, the same lessons were borne in upon him with increasing emphasis. Little wonder was it then that so many young medical men, bearing all these things in mind, decided that they, too, would enter this alluring field, where they believed

they would effect such marvelous results in brilliant cures, in abundant pecuniary reward, in the homage of their fellowmen, and, if moved by even higher motives, in the actual good they might do to suffering humanity. Boshier called attention to the importance of an academic education. Many a man had attained success in surgery without this advantage, but we were dealing with the rule, not the exception. This academic education should be truly liberal, both in quantity and quality, and should include as much as possible of studies of a scientific nature, especially biology, physics, and chemistry. Of these three branches, physics would prove of the greatest use to the surgeon, while biology and chemistry were branches of more practical value to the general practitioner. It was incumbent upon teachers and practitioners of surgery to make it plain to the public that there was a material difference between the trained surgeon and the novice. This education would enable the public to discriminate in a wholesome manner and would ultimately have the effect of rendering it apparent to the candidate for surgical practice that he must properly equip himself before he could stand before the world as a representative of the great surgical art.

[To be continued.]

WESTERN SURGICAL AND GYNECOLOGICAL ASSOCIATION.

Fifteenth Annual Meeting, Held in Kansas City, Mo.,
December 28 and 29, 1905.

[Specially reported for *American Medicine*.]

[Continued from page 267.]

A New Technic for Breast Amputation.—JABEZ N. JACKSON (Kansas City, Mo.) described a new technic for use in radical operation for carcinoma of the breast. The method of operation was devised by him about eight months ago and had since been used exclusively by him in all cases of this character with which he had to deal. From his experience, although limited to eight cases, he believed that the method had certain elements of advantage as well as originality that justified him in presenting it for a wider field of service. After describing the method at considerable length, he emphasized the following advantages: 1. The flap forms a covering for the chest defect, as a rule, without any tension, and thus almost entirely obviates the necessity of grafting, which is so frequent in other methods. In fact, I have not found any case operated on by my method that required grafting. This is not intended to cover cases where there has been extensive previous ulceration or where we cannot get healthy tissue for a flap of any character. 2. The drawing of the skin up to the arm does away with the fossa axillaris and thus with the large space which nature would have to obliterate by the formation of scar tissue with the resultant pressure upon the axillary vessels and nerves. 3. The ligation of all vessels at their nearest point of origin does away with the use of a large number of hemostatic forceps, which causes loss of time, to say nothing of the inconvenience of having a large number of instruments in one's way. I have in no instance used more than a dozen forceps in this operation, and can usually do the work with about six. The operation is thus shortened, so that, as a rule, I find that to complete it requires from 40 minutes to an hour, or thereabout. In fact, personally, I have never run beyond an hour, even doing the operation slowly, as I have in most cases; for the purpose of demonstrating this new technic, I have done the operation in a period of time as short as 40 minutes. 4. The most noticeable feature to the onlooker when the operation is done is the marked absence of hemorrhage, so that it can almost be called a bloodless operation. 5. The entire technical portion of the operation is completed before the chest is exposed by the removal of the breast; therefore, long exposure of an enormous area of raw chest surface, with the attendant

shock, is done away with. As soon as the breast is removed we are ready to close the wound.

Discussion.—CHARLES A. POWERS (Denver) said the key to the operation described by the essayist lay in the flap which covered the large skin defect, and as such it appealed to him. He asked Jackson whether in any of the cases there had been any sloughing at the corners of the quadrilateral flap. Personally, he had been very much pleased with the procedure of J. Collins Warren, of bringing up a flap from the arm. The technic of Jackson's operation was easier, he thought, and he would certainly employ this method in the future. JACKSON, in replying to Powers, said that in some instances there had been slight sloughing at the corners of the flap. In recent cases, by using a wide Halsted mattress suture for tension, he got union without sloughing.

Undescended Testicle.—A. E. BENJAMIN (Minneapolis, Minn.) said that the causes of undescended testicle might be due to improper development of the organ, to a rudimentary vaginal process, to peritoneal adhesions between the testicle and bladder or intestine, and to obstruction of the canal. The testicle might be found anywhere along its course of descent to a point just outside the external ring. Hernia was a common complication of this condition. The organ would not develop as well when located at any point above the scrotum. The possible sterility of the cryptorchid, and the frequency of malignant tuberculous and traumatic disturbances complicating this condition, all argued for an early operation to place the gland in its proper location. The operation for undescended testicle has been perfected in the last few years. It has been demonstrated that by careful dissection and an occasional sacrifice of the spermatic vessels that the organ would remain in the scrotum.

The Free Interval in Meningeal Hemorrhage.—F. GREGORY CONNELL (Salida, Col.) reported two cases, one of which was quite usual, with an interval of two hours, in which recovery followed operation. The other was one in which the patient retired for the night, five hours after a slight trauma, and was found dead in the morning. Autopsy revealed a fracture, with a large extradural clot from the lateral sinus. This second case was not very rare; but in 80 cases collected by the writer only two similar instances were encountered. The free interval was defined as a practically symptomless period of consciousness, which followed a primary, transitory unconsciousness, and preceded a secondary increasing and permanent loss of consciousness. This condition was usually found in association with a head injury. The cause of the bleeding was usually traumatism, with or without fracture. Various causes of the free interval were considered, with preference given to Kocher's explanation. The length of the free interval was studied in an analysis of the 80 cases, the average length being thirty-five hours. The difference between extradural and intradural hemorrhages was noted, and the long free interval in this series of cases was found to accompany the intradural hemorrhage. But it was stated that much stress could not be placed upon the length of the interval as a guide to the location of the hemorrhage. The typical train of events in a meningeal hemorrhage was (1) trauma; (2) concussion, unconsciousness; (3) consciousness, free interval; (4) compression, unconsciousness, but this might be variously modified. In the diagnosis, the focal signs were of more value than evidence of injury. The occurrence of collateral hemiplegia must be remembered. Fractures of limbs, previous paralysis, or congenital attachment of the iris had caused confusion in diagnosis. Contusion, or laceration of the brain, abscess, fat embolism, and other conditions might closely resemble meningeal hemorrhage. In the 80 collected cases, 52 were operated upon, and 28 were not. After operation there were 39 recoveries and 18 deaths. Without operative interference, 4 recovered and 24 died.

[To be continued.]

CLINICAL NOTES AND CORRESPONDENCE

[Communications are invited for this Department. The Editor is not responsible for the views advanced by any contributor.]

MEDICAL TEXTBOOKS IN KOREA.

BY

C. C. VINTON, M.D.,
of East Orange, N. J.

Korea was opened to foreign missions "at the point of the lancet." Now the missionary doctors there are endeavoring to educate a class of young physicians to become hospital assistants and to treat ordinary cases. The standard is not high, but will be advanced from year to year.

Medical education outside of Korea is hardly feasible to these students. Civilization civilizes too thoroughly. Aside from the fact that none have the means to carry them abroad and meet the cost of years of study there, it would be impossible for those so trained to return home to the former conditions of eating rice, sleeping on the floor, and herding in narrow, low-ceiled dwellings. Then again, native Korean practice, with its 40 ingredient prescriptions and its red-hot skewer thrust well nigh through an aching brain or abdominal cavity, is not accustomed to the idea of a medical fee. Instead, the doctor acts as his own druggist and sells the medicine he directs. Surgery in itself brings no pecuniary compensation, but the patient, if cured, sends some remuneration in the shape of eggs, chickens, fans, mats, even a bullock. True, hospitals are educating the people in many things; but it is well the first generation of native physicians should not hang out their shingles with too great expectations.

For the use of these young aspirants a set of medical textbooks has been prepared in their own language, abridged translations of Gray, Kirkes, Hare, etc., and are being issued on the mimeograph. Their publication in printed form is included in the scheme for a union publishing house, for which a committee is engaged in raising funds in this country. Any of our readers disposed to help may do so by sending their contribution to the Philadelphia members of this committee, Dr. H. Augustus Wilson and Dr. W. W. Keen.

DISLOCATION UPWARD AND BACKWARD OF THE STERNAL END OF THE CLAVICLE.¹

BY

R. M. SLAUGHTER, M.D.,
of Theological Seminary, Va.

President Medical Society of Northern Virginia; Treasurer Medical Society of Virginia; Member State Board of Medical Examiners.

Dislocation of the clavicle upward and backward is a luxation of great rarity and very difficult, if not impossible, to treat satisfactorily, except by operative measures. These facts, together with the very successful result obtained by operation in the following case, induce me to report it:

H. E., male, aged 22, a steeplechaser, received his injury on August 17, 1905, by being thrown over the head of the horse he was riding when the animal fell in attempting to clear a hurdle. The outer portion of his right shoulder evidently first struck the earth in falling, and the force of the contact produced the injury, an upward and backward dislocation of the sternal end of the right clavicle.

In his account of the accident, the patient stated that he did not at first think he was injured at all, but on attempting to get on his feet felt a sensation of being choked, and on putting up his hand found the end of the collar-bone pressing into the windpipe, as he described it. He came into my office soon afterward holding down

the clavicle with his hand, as there was a constant tendency for the bone to fly up against the trachea and produce the sensation of being strangled.

The dislocation could be easily reduced, and although retentive dressings and fixing the arm to the chest would overcome the tendency to ride up against the trachea, the end of the clavicle could not be kept in the sternal notch by any means I could devise, but would slip out and overlap the top of the sternum. Operative measures were then proposed and readily accepted, as he was, naturally, very anxious not to be permanently disabled.

On August 22 I operated at the George Washington University Hospital, Washington, D. C., with the able assistance of Dr. A. R. Shands, to whom I am indebted not only for his aid, but for valuable suggestions as well. An incision parallel to the clavicle showed absolute destruction of all the ligaments of the articulation, only stumps of these structures remaining. The cartilages covering the end of the clavicle and the sternal notch were extensively trimmed away to induce a free formation of new bone to hold permanently the clavicle in its proper position. Next, I drilled the clavicle and sutured it in position by passing a very large kangaroo-tendon through the costal attachment of the costoclavicular ligament. At the suggestion of Dr. Shands a small drill was introduced obliquely through the end of the clavicle into the sternum and left, its outer end projecting through an incision in the skin. The wound was closed and dressed, and the arm fixed to the chest plaster jacket.

At the end of 10 days the dressings and drill were removed. Everything was found in good condition. The arm was again firmly fixed to the chest with adhesive plaster and bandage, and kept so for a month, after which he was allowed gradually to resume use of it.

At the present time the result seems perfect, the clavicle being fixed by strong bony union, and for some weeks past he has been actively engaged in his former occupation of handling and training horses.

A DIE IN THE APPENDIX.

BY

A. F. WHEAT, M.D.,
of Manchester, N. H.

To the Editor of American Medicine:—Following is a report of the finding of a die in the appendix. This is the first instance so far as I know in which such a foreign body has been found. The patient was Miss A. G., aged 24, who was employed in the packing-room of a shoe factory. At 4 a.m. December 20, 1905, she had a sudden attack of pain in the lower abdomen. Temperature was normal. Vomitus greenish in color. Pain lasted all day. Afternoon temperature was 100°, pulse 95. Less pain during the night, though there was considerable vomiting. The temperature on the morning of December 21 was normal, pulse 90. She vomited frequently during day. I saw the patient in consultation late in the afternoon, temperature 101°, pulse 100, tenderness was present over the lower abdomen, a little more marked on the right side. The muscular rigidity on the right was very slight. Immediate operation was advised, and patient transferred to the Sacred Heart Hospital. A gridiron incision one inch in length was made and afterward enlarged to three inches. The appendix was the size and shape of a thumb, it was gangrenous in several places, and perforated at its base. It pointed upward and was adherent to the cecum throughout its length. Examination of the organ after removal discovered a die of the parchesi size. On questioning the patient the only information we could obtain was that about two years ago she remembered playing with dice once. Her family are opposed to games of any kind, and it was only for a few minutes that she handled the dice. One corner of the die broke off on being handled, but most of the spots on the die can be made out.

¹ Read before the Medical Society of Northern Virginia, November 15, 1905.

ORIGINAL ARTICLES

THE PUBLIC HEALTH LABORATORY: ITS FUNCTION AND RELATION TO GENERAL MEDICINE AND MODERN SOCIAL AND INDUSTRIAL ACTIVITY.¹

BY

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Professor of Pathology and Bacteriology, University of Minnesota, and
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State Board of Health.

A proper conception of the scope of public health laboratories is only to be obtained by the careful consideration of the relation of the laboratory and laboratory workers first, to general medicine, and secondly, to public health.

Medicine has profited by advance in many of the sciences, with nearly all of which she is closely allied, and in public health not only are all the sciences used but every activity of man and even of many of the animals has to be reckoned with. The chemist is continually furnishing new drugs, and has provided the basis of most of our diagnostic methods. The work of the physicist has enabled us to illuminate the interior of body cavities, to see and photograph imbedded foreign bodies, to use the various light rays and forms of current in treatment, and has given us the microscope. Botanical studies afford information which ranges from the effect of algæ and microscopic plant life upon water supplies and sewage disposal to the baneful or beneficent properties of the higher plants. The study of the life histories of bacteria and the physiologic activities and anatomic changes due to their presence in the animal body seems inexhaustible. It has even become necessary for the physician to identify and circumvent various species of mosquitos, flies and ticks in relation to yellow fever, malaria, sleeping-sickness, spotted fever and such kindred diseases as are due to the hematozoa. In fact the student or practitioner of medicine must be trained in all of the sciences and have a surface knowledge of most of the trades and professions.

But upon these matters, all who are interested in the cause, prevention and cure of disease should be informed and no sharp line of demarcation between clinical and laboratory observation is possible nor is it desirable. Every intelligent practitioner must be thoroughly familiar with the principles, if not with the minutiae, of laboratory practice. It is equally important for those who elect to pursue the experimental and laboratory study of disease, to have a comprehensive and definite grasp of the clinical side of the problem with all its possibilities and limitations.

In the actual study of specific cases of obscure disease, clinicians should employ all of the means at their command for determining the cause of the condition. At

times one is almost forced to believe that the introduction of such an armamentarium of special laboratory methods has resulted in the neglect of some of the more simple and direct means of observation upon which our grandfathers depended for their guidance.

Whilst recognizing the importance of the so-called "Widal test," blood examinations for the hematozoa, differential blood counts, the bacterioscopic study of various body fluids and exudates, the histologic examination of tumors and similar procedures, we should not fail to make most careful observations upon the patient nor to preserve systematic chronologic record of his past and present condition and note the details of therapeutic interference.

Ability to accomplish satisfactory laboratory work does not depend essentially upon initial mental or physical attributes or prolonged special training, but upon a capacity for painstaking, systematic work, the possession of certain apparatus and equipment, not necessarily expensive or complicated but which must be *always* ready for use, some ability to adapt methods to special emergencies, and above all the faculty of weighing the evidence furnished by observation and drawing correct conclusions therefrom. This latter qualification, so erroneously called "common sense," is equally necessary, whether the observation be made directly upon the patient himself, or through a microscope or in a test tube upon his tissues or fluids. It is true that laboratory methods have become so numerous and complicated that to keep abreast of them and to maintain the special apparatus and laboratory facilities constantly ready for immediate use, are a tax upon one's energy and ability. This, doubtless, constitutes the reason for the present day proneness to divide sharply the study and practice of medicine into the clinical and laboratory branches, which will prove most unfortunate if it limits the general view of the worker in either field.

If the laboratory is to serve as the source of information additional to all that which can and should be obtained at the bedside, it is very evident that the clinician and laboratory man should be in full accord. In other words, each should have had thorough training in both branches and be able to follow and assist the other to observe and draw deductions from what has been seen by either or both.

Where possible, the laboratory consultant should visit the patient with the attending physician, in order to aid in the collection of the material for laboratory examination, and to familiarize himself with the case history and clinical data. This, although unnecessary in some instances, is helpful always, and in many cases imperative, particularly in bacteriologic investigations and blood work, where hours or perhaps days of laborious and fruitless work may be thereby avoided.

By whom the interpretation of the laboratory findings is to be made, constitutes a nice question. If by the

¹Read before the North Dakota Medical Society, May 24, 1905.

attending physician alone, he must be familiar with laboratory technical methods; if by the laboratory man, he must be familiar with clinical matters in general and with all of the pertinent facts in the particular case in point. It is clear that both men should be trained in both branches, each should be familiar with the other's data and the interpretation of the findings should be made in consultation.

To expect the laboratory man to be able to make intelligent report on materials submitted without full data, is flattering to his omniscience, but is likely to prove disappointing. Presumably both are actuated by the same motives which include an interest in the study of medical problems and a desire to earn the daily bread. To limit the laboratory man to such mechanical work as the routine staining of tissues, the cultivation of bacteria or employment of chemical tests is to cut him off from the broad field of research in medicine where it is necessary to study systematically all available clinical and experimental data. Routine practice becomes research when all data are thus studied. Painstaking laboratory work and records lose a part or all of their value unless equally perfect clinical study and record precede, accompany and follow them throughout the whole history of the case. A consultant's place, with fees which correspond to the time given to the problem and the magnitude of responsibility assumed, are due the laboratory worker. If his training has been as thorough and as costly as that of the clinician, and he is required to assume the same or greater responsibility in affording a diagnosis as the basis for prognosis and treatment, the laboratory man should be treated like a consultant in other lines of private practice.

If laboratory work is to be considered by itself, it is apparent that laboratories and laboratory workers may be classified into several groups.

(1) Consultants in laboratory practice, whose chief activities are to be directed in the line of diagnosis and such studies as will enable the practitioner to give a more definite prognosis and be a guide to therapeutic measures. As we have already seen, this phase of the practice of medicine has not been properly recognized and developed.

(2) Research as to the cause, prevention and cure of disease. This should be conducted by men who are capable of giving uninterrupted attention to the problems involved for considerable periods of time. The Rockefeller Institute in America, the Lister Institute of Great Britain, and numerous other research institutes in Europe, have been established in order to enable well-equipped men to pursue such uninterrupted studies.

(3) Teaching positions in connection with universities and medical schools, which should include opportunities for research. It is the common complaint of all laboratory men holding such appointments that in-

sufficient time and opportunity are afforded for research and that in order to supplement their incomes it is frequently necessary for them to engage in practice or in other work which largely eliminates research, and may even interfere, to some extent, with teaching.

(4) Laboratories in connection with hospitals for the working out of cases which have been thoroughly studied clinically and in which a complete record of all of the histories, findings and therapeutic interferences are maintained. These must continue to be in growing demand. By the careful study of large numbers of observations and their proper systematization such combined work will yield most valuable results. The so-called diagnostic laboratories in connection with commercial houses need only be mentioned in order to be condemned. Every one who is familiar with the requirements of such medical study knows that the "correspondence school" method of diagnosis is not to be relied upon. An opinion based upon such investigation is very often worse than valueless, since it is likely to prove misleading and prevent the physician, who is in attendance upon the case, from following out other lines open to him which might yield valuable information.

By "diagnosis and opinion," as used above, I do not mean a mere summary of the laboratory findings but the attempt often made to generalize from the material examined and the information received. The material forwarded for examination is frequently not well selected and the data may be so limited as to amount to "misinformation."

(5) Public health laboratories as a part of the general machinery for locating and eradicating foci of disease. Such laboratories are being utilized throughout the whole civilized world. Our own land stands in the forefront in the utilization of such laboratory work and methods as a basis for executive action. Many misconceptions, however, exist in the minds of those who have not given the matter sufficient attention. In the first place, the legitimate work of such laboratories must be considered and only such investigations should be undertaken as will yield exact information for the immediate or prospective suppression of disease. Since there is little differentiation in the eyes of the public between the various kinds of laboratories and laboratory workers, it becomes necessary for the profession to aid in the enlightenment of the public.

Unless it be agreed that laboratory consultation differs from consulting work in other lines of medical practice, care must be taken to prevent pauperization of this branch of the profession. There is no reason why examinations, which are of direct benefit only to the physician as affording a diagnosis or a guide to treatment should be done at the expense of the municipality, State or government, provided the patient is able to pay for medical attendance. If not, he should go to a public in-

stitution or hospital, where his disease can be studied and he can be treated. When the laboratory can afford enlightenment as to the cause of a transmissible disease and when the existence of that disease is reported to the executive health officer with full particulars, so that it becomes a matter of public record, and the public is thus fully warned and protected against the possibility of infection from that case, it is certain that the laboratory work should be done at the expense of the public, just as the executive work is done at the expense of the public. No one will question the propriety of laboratory examination in diphtheria, in which such examination is used as the basis for restrictive measures, and in which those individuals who are found infected with *B. diphtheriae* are prevented from infecting others. This method of dealing with diphtheria has more than neutralized the somewhat harmful effect which seemed likely to follow the adoption of the antitoxic treatment of the disease. I mean by this that diphtheria antitoxin is such a potent and specific cure for diphtheria that in relying upon it we were somewhat in danger of becoming too lax in our restrictive measures.

In the matter of the examination of sputum, fluids or tissues for the presence of *B. tuberculosis*, we are confronted by a somewhat different problem. If all cases of tuberculosis are reported, whether for purposes of quarantine or for purposes of educating the public, there is no question but that the examination of sputum at the expense of the public is more than warranted. Full particulars concerning the patient, his environment, the existing possibilities for the infection of others and the means which are being taken to protect his associates and the general public, should be fully recorded with the local authorities who provide the examination. When the sputum examination serves only as an aid to diagnosis for the physician and is not utilized in any public way, it should not be done in a public health laboratory, but as a matter of consultation by a man who is duly qualified for the work, if the attending physician is unable to make such an examination himself.

In the investigation of material from typhoid patients, with the exception of the examination of blood for the presence of the "Widal" reaction, there is little which can be done by examination of shipped specimens. It is possible that the development of better laboratory technic with concurrent study on the part of the general practitioner may later result in the possibility of satisfactory laboratory examination of urine, blood and possibly feces. Such examinations are, at present, rarely made, as they call for the presence of the laboratory man at the bedside of the patient. But even typhoid blood examinations for "Widal" reaction should not be made, unless the disease is made reportable to the health authorities and full particulars are filed in regard to all the cases with their possible relationships to each other and to a common source. Too often the procedure is

that in any case of continued fever, typhoid infection is suspected, and a specimen of blood is sent to the laboratory in order to determine the presence of the "Widal" reaction, without waiting to make careful inquiry as to conditions and a proper examination of the patient. Very often, one of the first things which is done is that the physician collects a sample of water from the family well and sends that to the laboratory for examination as to the presence of *B. typhosus*. Thus the clinical man may do twenty minutes' work himself and set the laboratory man a needless and impossible task of answering questions which he himself can best solve. The investigation of water supplies is a matter which should be dealt with separately, however.

In malarial districts the relationship of the mosquito to the disease is recognized, and steps are being taken to eradicate mosquitos and to protect the patient from mosquito bites, so that mosquitos may not thus become infected and later spread the disease. Physicians are being trained when and how to make blood specimens, and under these circumstances, it is very proper for the public health laboratories to investigate and report upon such blood preparations, provided that full collateral information is filed with the health authorities, in order that intelligent prophylaxis may be inaugurated. The study of mosquitos in relation to malaria and yellow fever, the study of ticks in relation to infection of man and animals, and the activities of flies in the transference of typhoid, cholera, etc., are very important branches of study for such laboratories. In bubonic plague, rats must be caught in large numbers and examined as to the presence of the infecting microorganism.

By a study of the blood reactions of treated animals it is possible, as we know, to diagnose typhoid fever and it is of use also in relation to Asiatic cholera and certain other forms of infection, but it involves a great deal of inconvenience, since inoculated animals and pure cultures of bacteria must always be kept on hand.

The relation of food products to disease is of vital importance, but is dealt with differently in different localities. In Massachusetts the State Board of Health examines and reports upon food and food adulterations, and their studies have proved extremely interesting and valuable. In certain States, including Minnesota, food and dairy products are under a separate commission. Infectious diseases of animals, with their study and control, are sometimes under the jurisdiction of Boards of Health and sometimes administered by separate bureaus. Where there is division of authority, it is likely that a good many important matters of common interest may be overlooked. This is true in relation to the diseases of animals which are transferable to men, such as tuberculosis, rabies, anthrax, glanders, actinomycosis, etc. There is also such danger in connection with the animal food products, such as milk and meat, since each authority may leave investigation and administration to the

other. The same methods, the same laboratories and the same equipment can be advantageously used for the study of all of these problems and similar legal restrictive measures employed in their control. Food poisonings and outbreaks of infectious diseases in animals, which seem to have a relationship to diseases of man, should certainly be studied by public health laboratories, but this cannot be done on shipped samples, and it becomes necessary for the laboratory man to go into the field with the veterinarian, food inspector or other person in local executive charge. It is impossible in most cases of obscure disease to make satisfactory examinations upon shipped specimens, unless the person forwarding the specimen is thoroughly trained in laboratory work, and will see that full data is forwarded immediately, that the materials are collected in satisfactory condition and that the bacteriologic examination, when such is necessary, is begun in the field. It sometimes happens that certain samples should be iced if they are to be transported or that definite methods, which will vary with conditions, must be employed. No fixed rule can, therefore, be made for such classes of investigation which will permit of satisfactory long range operation. Certainly the man in charge of laboratory work should be familiar with the medical aspects of the case and with all pertinent facts.

It is impossible within the limits of this communication to go into the relationship of public health laboratories to water supplies and sewage disposal. Suffice it to say, that the laboratory examination of water is not of great value unless full information concerning all the local conditions is at hand. Furthermore, bacteriologic examinations of water should be begun in the field in order to know the exact bacterial content of the water in its normal condition. Bacteria increase in number or may die out during transit. Even icing of samples does not give entirely satisfactory results. It does not seem to be generally recognized that *B. typhosus* or the vibrio of Asiatic cholera cannot be demonstrated with accuracy in water supplies which there is or has been reason to suspect. The presence of *B. coli communis*, the normal inhabitant of the intestine of mammals, is usually taken as an index of fecal contamination, but the number of the microorganisms is important.

The bacteriologic examination of water is largely superseding chemical analysis, which latter is of importance in relationship to the commercial aspects of water such as its use in boilers, laundries, manufacturing, etc. It is of value also in checking the results of bacteriologic analysis.

When such full data concerning environment, history of disease, with accurate dates, maps, photographs, etc., are available, consultation of the laboratory man with the consulting engineer and the local and executive authorities becomes necessary in making final recommendation or demand. Certainly matters affecting

public supplies, epidemics and such problems should be investigated in this consulting way by public health laboratories, but not miscellaneous, dataless shipped samples from private wells, which are of no public value.

Without wishing to go too exhaustively into the various important phases of the question of the responsibilities and limitations of public health laboratories, it is very easily seen that

(1) Public health laboratories constitute a very valuable aid in the detection of foci of disease.

(2) The problems studied and the work done by such laboratories should be limited to matters of public import where the information yielded will be fully utilized in the protection of the public. Under present conditions, examinations of tumors, urine, blood, etc., do not fall within this list. There is no reason why expert opinion upon such matters should not be regarded as matters of medical consultation.

(3) In order that results of the most value to the public may be secured, it is absolutely certain that the public health laboratory should constitute a part of the general public health machinery. The executive officer has to depend upon the laboratory for information as to conditions and as a guide to his action.

(4) It is necessary in many instances for the laboratory man to go into the field, when, if he be properly trained, he may accumulate full information not only in regard to laboratory matters but as to affairs in general, which may later be used by the executive officer. It is frequently very desirable for the executive officer and the laboratory worker to go into the field together or for the executive officer to delegate authority to the laboratory man.

(5) In all work of public health laboratories, which is so apt to become mere routine, the work should be done and recorded in such a way as to be capable of utilization in research. Enthusiasm and interest in any line of work is the worker's chiefest asset. It should, therefore, be the aim of all public health organizations to stimulate systematic and concerted research in their laboratories.

CAUSE OF EPILEPSY.

BY

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Epilepsy is not a rare disease. According to Prout, one out of every 500 inhabitants of the United States is a sufferer from this malady. In one-third to one-half of all cases a taint is found, an inherited neuropathic constitution, and in two-thirds of these, the inheritance is direct and of the same character. The convulsions of childhood frequently pass into genuine epilepsy in later life—indicating the inheritance.

Numberless and varied are the causes said to produce the disease. Among these may be mentioned cerebral

tumor and hydrocephalus, chronic alcoholism, lead intoxication, syphilis and arteriosclerosis; heart disease, especially aortic stenosis, mitral insufficiency and nephritis, the acute infectious diseases, scarlet fever, small-pox and whoopingcough, typhoid fever, measles and grip; constipation and parasitic diseases of the intestines; a scar somewhere in the periphery, diseases of the nose, stomach and uterus, a foreign body in the ear, a carious tooth, an adherent prepuce or clitoris; trauma (light or severe); fright, anger, teething, menstruation, worry, excitement and paroxysms of coughing. To bring some system out of this chaos the disease is spoken of as idiopathic, symptomatic, and reflex epilepsy.

The pathology is negative; no lesion has been found to explain the disease, although every pathologic condition of the cerebrospinal system may be present.

Chronic disease of vessels, cerebral tumor, cysts, abscess, bony splinters, exostoses, cysticercus, hardening and softening, stigmata of degeneracy, residua of old diseased conditions, and especially those of infantile cerebral palsies, are found. The lesions are most varied and have apparently no direct connection with the disease.

An increase of the neuroglia of the cortex, a kind of sclerosis, seems to be a uniform consequence of the trouble. The symptomatology is as interesting as is the etiology and pathology. In all cases we have intervals of perfect health followed by attacks mild or severe, half sided only, or involving the whole body, and accordingly these seizures are spoken of as petit mal, grand mal, Jacksonian and genuine epilepsy. An aura may precede the attack and does so in many instances—and may be motor, sensory, secretory, vasomotor, visceral, or psychic in character. The onset is sudden and may occur at any time, day or night, without any apparent cause, though indigestion, overexertion, coitus, constipation, etc., are frequently ascribed as causes by the patient.

A sudden dizziness, palpitation, or slowing of pulse, a sudden perspiration or flushing of the face, an anxiety without cause, and a sensation as if paralyzed with complete inability to move are considered epileptoid. Whereas, a sudden loss of consciousness, lasting a few seconds, and occurring without warning, or following an aura, accompanied perhaps by a few light convulsive movements, a sudden cry or fall, may constitute the attack, after which the patient continues his hardly interrupted work; or a severe tetanic convulsion may seize the patient, forcing the air through the closed glottis and causing the peculiar epileptic cry. The patient falls as if struck by lightning, the face, pale at first, becomes livid and appears bloated, the bulbs protrude and seem to come out of their sockets, reflexes are absent, the pupils are dilated and do not react, the head is thrown backward or to the side, arms and legs are stretched and the hands are clenched to a fist; foam, saliva, mucus, and sometimes blood, flow from the mouth, and urine, which occasion-

ally contains albumin, and feces are passed. After a few seconds, convulsive movements follow, short and jerky and rapidly growing in intensity and violence, causing tongue bite and frequently severe injury to the patient; after a few minutes the convulsions become less and less violent, and the patient passes into a state of coma and then into a deep sleep from which he awakes with complete amnesia.

In some cases this extends to events that have taken place previous to the attack. During the seizure the temperature rises 0.1° to 0.5° C., but is considerably higher during the epileptic state in which one violent attack follows another in rapid succession.

There is a peculiar psychic condition that may precede the attack, take its place and become its equivalent or follow it. During this state, the "Dämmerzustand" of the Germans, a state of twilight of consciousness or trance, the character of the patient is entirely changed and though his acts may appear rational to strangers they are recognized as entirely foreign to him by his relatives and friends. The patient may leave his family without any cause or commit theft, arson, or murder or on awakening find himself miles away from his home or accused of a crime. Sudden onset, changed consciousness, and partial or complete amnesia are characteristic of this state.

The acts committed by these patients during this state are reproduced with almost photographic exactness. Psychoses, mania, melancholia, paranoia, etc., may complicate epilepsy but can be diagnosed as epileptic only by those symptoms that characterize this disease. As the malady continues a change in the nature of the patient is noticed; slowly the higher faculties are blunted, the intellectual capital is lost and imbecility marks the advanced stage.

In glancing over these data, which, I believe, give a fair idea of epilepsy, one is forcibly struck with the large number of patients in whose history the disease itself or a neuropathic constitution may be positively traced; by the large variety of etiologic factors, and by the numberless lesions that are found in the epileptic brain. These important facts show almost conclusively that the basis of epilepsy is a pathologic condition of the brain, congenital or acquired, the essential feature of which is its instability. Another most striking point is the clinical picture that is presented by the seizure, be it mild or severe, Jacksonian or genuine, symptomatic or reflex. It may vary in its details but remains the same in its characteristic features, whether it occurs in childhood or old age, in male or female, and which are a sudden onset with or without preceding aura, tonic and clonic convulsions, coma and deep sleep, and partial or complete loss of consciousness and amnesia. Some are present in the mild, all, more or less, in the severe cases, succeeding one another in the same way.

Such a clinical picture occurring under the most

varied conditions uninfluenced by sex, age, and climate, calls for one single cause which according to the violence with which it acts produces attacks of lesser or greater severity. The cause is "congestion and edema."

In cerebral hemorrhage we find almost the identical symptoms of an epileptic seizure, and the most frequent causes of apoplexy, intoxication and infection, chronic alcoholism, Bright's disease, lead intoxication, syphilis, arteriosclerosis, etc., produce epilepsy.

Prodromes resembling an aura may precede the attack. There is a sudden onset, the patient falls as if struck by lightning and may be seized with convulsions; coma follows, passing into somnolence, the face appears livid and bloated, the reflexes are absent, pupils do not react to light, and urine and feces are passed. The urine contains albumin, and loss of consciousness and amnesia is complete. As in epilepsy the attack seizes the patient without warning and apparent cause, and as in that malady it attacks the motor area and comes on frequently at night, due to the difficult return of blood when lying on the back.

The direct and immediate cause in apoplexy is the exudation of blood and its pressure upon the cortical and subcortical tissue, and in epilepsy it is the exudation of serum and its pressure upon the same tissue, only after these pressure symptoms have disappeared, the symptoms due to the destructive process, the hemiplegia, become prominent.

In Bright's disease it may become difficult to decide whether the attack is apoplectic or epileptic. The same history of an attack, typical for either, may be followed by hemiplegia. If due to hemorrhage it is permanent, if due to edema it is passing. The capillaries springing from the arteria fossa sylvii do not anastomose and are therefore under relatively constant pressure and the capillaries of the cortex though forming a dense network possess only small anastomoses. This arrangement favors hemorrhage and exudation of serum. The amount of lymph produced in any part depends on the pressure at which the blood is flowing through the capillaries and on the permeability of the capillary walls—and the flow of lymph may therefore be increased by increasing intracapillary pressure and by increasing the permeability of the capillary walls by injuring their vitality.

With this theory, we can readily explain the effect of the various causes that have been observed to produce epilepsy. Congestion or edema (which may be a mere excess of serum or amount to a decided form) acts as a certain stimulus upon a brain, the equilibrium of which is easily disturbed, due to congenital defect or disease during life. The brain answers this stimulus with the same train of symptoms with never failing certainty.

The cause of nephritis is an intoxication and its prominent symptoms are vascular tension and local edemas; chronic alcoholism, lead intoxication, syphilis and arteriosclerosis cause cardiovascular disease, and in-

creased pressure and heart disease, especially mitral insufficiency, give rise to venous engorgement.

The infectious diseases, constipation and parasitic diseases of the intestines cause congestions and cerebral tumors and hydrocephalus, intracranial pressure; all pathologic conditions favoring exudation of lymph.

That under given conditions by reflex from the periphery, a scar, diseases of the nose, stomach, and uterus, a foreign body in the ear, a carious tooth, adherent prepuce or clitoris, etc., may cause a disturbance of the cerebral circulation and exudation of lymph is probable. Anger, worry and excitement, overexertion, coitus, violent coughing spells, etc., raise blood pressure and act as a direct and immediate cause.

Consideration of the pathology shows that the most striking feature is the absence of any lesion that will explain the disease; with this theory we could not expect a lesion. On the other hand, the great variety of the diseases found associated with the epileptic brain either serve to explain its easily disturbed equilibrium or directly tend to produce increased pressure, or do both.

The cortical gliosis or sclerosis with cell destruction, the only defect which is constantly found in epileptics, could be expected as a consequence of congestion, exudation of lymph and pressure—explaining the progressive epileptic dementia.

Little is to be said to explain the symptoms. The epileptoid signs—the mild and severe attacks, the intervals of perfect health; the genuine, symptomatic and reflex and Jacksonian epilepsy in which only one-half of the brain is so affected as to furnish a basis for an attack—all are readily explained. The seizure itself bears such close resemblance to apoplexy that it does not need any further consideration, and the exudation of blood on the one hand and of serum on the other accounts for this resemblance. The skull of a patient supposed to have been struck by apoplexy was trephined and a large amount of serous fluid instead of the expected blood clot was found. One month later a revised diagnosis of postepileptic state was made.* The periodic, peculiar psychic disturbances which may precede, take the place of or follow the attack are not quite so easily explained. Yet alcohol increases and frequently produces them, and has been the provoking agent of many crimes committed by epileptics. Alcohol causes vasomotor paralysis and congestion. This, and the fact that in quite a number of instances constipation and menstruation have been found as an exciting factor of these states, and the resemblance these bear to the periodic psychoses, especially in their periodicity and sameness of attack, seem to prove that a like cause, congestion and excess of lymph, acting upon a diseased brain under certain conditions may give rise to them. The psychoses that complicate epilepsy hardly need to be considered; they are simply complications of

* Prince: Boston Med. and Surg. Jour., August 10, 1905.

the malady that do not show any differentiating symptoms from the same psychoses of the nonepileptic.

It can be easily understood why the therapeutic measures that have been adopted are more or less efficient. It has been estimated that the seizures in epilepsy can be reduced one-third to one-half by regulation of the diet. This has to be prepared in each individual case and must vary according to the various etiologic factors found and the present state of the patient, wasted or fat, full blooded or anemic, young or aged, suffering from nephritis, cardiovascular disease, etc.

It is impossible to lay down hard and fast rules, though it may be said that in each and every case the diet must be bland and easily digestible. As a rule soups and excess of liquids must be avoided; and highly seasoned foods, spices and condiments must not be taken. The coarse vegetables are difficult to digest and cause flatulency, and sweets, cakes and pastry are rarely well borne. Meat ought as a rule to be taken in great moderation, and coffee, tea, tobacco and all alcoholic beverages are injurious. Alcohol in any form is doubly poisonous to the epileptic.

The aim of the diet must be to reduce blood pressure and to prevent the formation of toxic substances which increase it and irritate the centers, and all the tissues and organs of the body.

Salt is especially injurious in this disease, a fact recognized in past ages. Why it is so, can readily be explained by this theory: it is a lymphagog, *i. e.*, it increases the flow of lymph by attracting water from the tissues into the blood, thus increasing the volume of the circulating fluid, raising intracapillary pressure and causing exudation of lymph most marked where this pressure is usually highest. It is a wellknown fact that the edemas of nephritis are favorably influenced by the withdrawal of salt from the diet.

Exercise and hydrotherapeutic measures are always of importance in the treatment of the epileptic, but it is as impossible to lay down general rules for the employment of these powerful therapeutic agents, as it is to give arbitrary dietary rules. The proper measures must be carefully selected for each individual, young or old, strong or weak, suffering from Bright's disease or heart disease, etc.

Generally the objects are to reduce blood pressure; burn up toxins; favor elimination by all channels; increase circulation; and strengthen the organism. The bowels must be well attended to, as free purgation removes toxins that cause congestion and irritation of centers and also gives relief by removing fluid from the body. Few drugs have stood the test of time, and of these the bromids are the most reliable. Their physiologic action is well understood. They diminish heart force, lower vascular tension, make the brain anemic and decrease cortex irritability. The amount administered must be increased until the fits are under control, and

when this is accomplished the dose should be continued for a year or two and gradually withdrawn.

Atropin has given good results in cases in which the bromids have failed, the physiologic action of atropin that is of importance being its power to contract, and secondarily to relax the arterioles. The increased pressure relieves congestion and increases arterial and capillary circulation; the peripheral vessels fill with blood and the skin becomes red and warm.

In some instances the inhalation of amyl nitrite and the administration of nitroglycerin has proved of value to abort the attack. These drugs act upon the vasomotor centers, lower arterial tension and produce dilation of the arterioles in all parts of the body. A pale face, with a cold and clammy skin and tense pulse, would indicate their use. The foregoing would seem to prove that epilepsy is due to local congestion and edema acting upon a sensitive and unstable brain.

The arrangement of capillaries to the motor area favors intracapillary pressure. The etiologic factors and pathologic lesions favor congestion and permeability of capillary walls. There is an absence of a permanent lesion to explain the malady, while the permanent lesion found is readily explained as the consequence of congestion. The resemblance of the apoplectic and epileptic attack (hemorrhage—edema) in their essential features seems to show a like cause. The ready explanation of the various forms of the malady agrees with this theory. Withdrawal of salt lessens frequency and violence of attacks, action of bromids, of atropin, of amyl nitrite, nitroglycerin, free purgation and venesection, the influence of the mechanic dietetic treatment upon the disease.

Many theories have been advanced, but none explains. The one most widely accepted at the present time is that the disease is due to autointoxication. An excess of waste matter in the blood produced by a defective metabolism or retained on account of insufficient elimination will irritate the nerve centers and make them oversensitive, and by irritating the vasomotor centers will cause congestion. It acts like many of the other etiologic factors, gives instability to the brain and causes congestion and edema. The view of Strümpell and others that epilepsy is due to a permanent abnormal condition of the cerebral cortex, and that the individual convulsions are caused by the sudden removal of inhibitory influences and the discharge of all the stored up motor impulses, seems even less satisfactory. Eclampsia, which is almost always associated with kidney disease and resembles epilepsy, seems to have its rise from the same cause. Therefore, it can be readily understood why venesection should prove of benefit in both maladies; it removes toxins and relieves congestion.

Maryland Senate Passes Cigaret Bill.—The State Senate has passed a bill imposing a penalty of \$25 for the first offence and \$100 for the second upon any person who sells, barbers, gives away, or in any manner disposes of cigarettes in the State of Maryland.

CHRONIC URETHRITIS AND AN IMPROVED METHOD OF APPLYING MEDICATION TO THE URETHRA.

BY

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Many attempts have been made to obtain a satisfactory method of introducing ointment into the urethral canal. Among them may be mentioned the cupped sound with which all are familiar; the grooved sound of Rhodes¹ and the ribbed sounds are not so well known. Others have used very tenacious ointments to smear on the sounds to introduce into the urethra. It is needless to say this method was unsatisfactory, as were the cupped and grooved sounds, which are always more or less irritating.

The method I will now describe was the result of my efforts to use the solidified ointment of Unna, which contained, in addition to silver nitrate and cocoa butter, balsam of Peru and white wax to harden the ointment on the sounds when suspended in a cool place. This would collect on the dependent portions and make the layer uneven, and was so troublesome and interfered so much with any attempts toward a careful technic that the method was abandoned. Later it occurred to me that the sounds might be cooled in ice-water, which overcame so easily the former difficulties that I have adopted it as a routine method of applying medicine to the urethral canal in many chronic conditions and will describe it in detail.

Medicated sounds are of distinct value in treating chronic urethritis for the following reasons:

1. They are easy of application and combine more valuable features than any other single remedy.
2. A uniform application to the stretched mucous membrane is obtained.
3. The ointment may be gently massaged into the follicles and recesses where the organisms are usually protected from treatment or the urinary stream.
4. This massage and the stimulating action of the cold sound hasten the absorption of the inflammatory exudate.
5. In case there is a stricture in the formative stage from a granular patch or from a localized inflammation, this is the treatment *par excellence* for curing the discharge and removing the shreds, as well as preventing organization of the exudate and the formation of a stricture by its prompt absorption.
6. If a stricture has already formed, the dilation, with a local application to the mucous membrane to allay the inflammation and gentle massage at the point of constriction to increase the reaction, brings into action more factors toward its cure than any other single treatment.
7. Nodular masses and thickening of the mucous membrane are more promptly absorbed, because the lymphatic and bloodvessels are toned up by the massage, cold, and medication.
8. Whatever medicine the surgeon prefers may be applied in this manner. This includes cocaine, which requires, however, one and a half times as much as would ordinarily be used if dissolved in water.

The sounds are prepared in the following manner: Silver nitrate 2 gm. to 3 gm. ($\frac{1}{2}$ dr. to 45 gr.) or the medicament desired is powdered and mixed with 180 gm.

(6 oz.) of melted cocoa butter, which is placed in a tall, wide-mouth bottle. It should be sterilized occasionally by boiling in a water bath. When to be used, melt by placing in hot water or on a steam radiator, etc. The largest sound that can be easily passed and another three sizes smaller are sterilized and placed in a pitcher of ice water. The large sound is now lubricated, introduced, and left in place for three to eight minutes, according to the conditions. The smaller one is dipped into the melted ointment, withdrawn and manipulated for a moment while it cools to obtain a uniform layer, and is then placed in the ice water. The cold hardens the cocoa butter (see Fig.) and it may be introduced before it melts, while the canal is cool from the larger sound which is passed first, to prepare the way by overcoming any spasmodic obstruction, and to dilate the stricture, if one exists. The stimulating action of the cold is also desirable. In certain cases benefit will come from the use of the "psychophor" and ice-water when more prolonged cold is desired in addition to the medicated ointment. The canal may be irrigated before each treatment. Massage along the urethra can be done painlessly by steadying the sound with the right hand to furnish counterpressure against the fingers of the left, which devote special attention to the bulb and indurated points. Force of any kind should never be used, nor is the treatment applicable to any acute condition, and unless this is borne in mind much harm can be done by using this method too early. The intervals between treatments vary from one to four days, according to the reaction which follows and the condition being treated.

The strength of the ointment is increased as the urethra becomes more tolerant. An excess of silver nitrate may be removed from the cocoa butter by melting and shaking it with water, then inverting the bottle and allowing it to cool. The water containing silver nitrate may be poured off, leaving the solid cocoa butter. Unless the effect of the preliminary sound is desired, it need not be introduced, as the cocoa butter will not melt before the medicated sound can be passed. Special indications for the use of these medicated sounds will be discussed later, also other remedies which are to supplement this treatment according to the conditions being combated.

Chronic Gonorrhea and Gleet.—These terms have long ago been shown not to be synonymous, for a gleet¹ may exist when persistent search fails to show gonococci, and on the other hand chronic gonorrhea need not cause a discharge. *The varieties* as given by Lydston are: 1. When it remains rather subacute, causing pain and discomfort on urinating and with frequent exacerbations, the prostate being often involved with a feeling of fulness in the perineum and the other symptoms that accompany it. 2. When the discharge is very thin and watery or only evident in the morning—no discomfort. This class is more frequent than the first, and depends upon (a) a simple catarrhal condition of the mucous membrane from systemic trouble; (b) congested and granular patches; (c) organic stricture; (d) abscess or fistula; (e) dilation and chronic inflammation of the lacuna magna; (f) posterior urethritis; (g)

folliculitis ; (h) cowperitis ; (i) tuberculosis, which may be engrafted upon a chronic gonorrheal urethritis. 3. Conditions apparently cured but in which sexual excesses, intemperance, etc., set up a mucopurulent discharge.

The causes of chronic urethritis in the large majority of patients are inefficient treatment and excesses during the acute attack or the convalescent period of gonorrhea. Very severe acute cases and especially reinfections may leave patches of submucous thickening which prolong the discharge and finally result in a stricture, which is one of the most frequent causes of a chronic discharge. Too early cessation of treatment is another important cause. The starting-point is usually in the mucous depressions where the inflammation persists and the organism is protected from the urinary stream as well as urethral irrigations or injections. Here the gonococci lurk ready to increase their virulence at the proper stimulus or when the immune antibodies that have developed from the constant infection become less active. The condition is well likened to a nation trying to preserve peace in her colonies. When order has been restored only a few soldiers are retained ; these are the immune antibodies which have been gradually "mustered out" after the rebellious subjects or rather the invading army (the gonococci) have been repulsed.

The gonococci are not completely exterminated, however, and although lying dormant they are constantly on the alert for an opportunity for another uprising. After a period of quiescence more or less complete, a stimulus is received in the form of congestion from dietary or alcoholic excesses, or sexual excitement, or lowered resistance on the part of the host ; any of these probably furnishes a more favorable soil and there is an insurrection of gonococci. The system having retained some of her immune antibodies and being partially prepared for the fight, begins the battle more promptly than on the first attack, and with the aid of the volunteers called into service, the uprising is more readily controlled. Two points are noteworthy ; the fight began more promptly and was of shorter duration than was the primary acute attack because of the partial immunity and a readiness on the part of the system to resist the invasion, for these same germs implanted upon fresh soil will often cause severe gonorrheal urethritis.

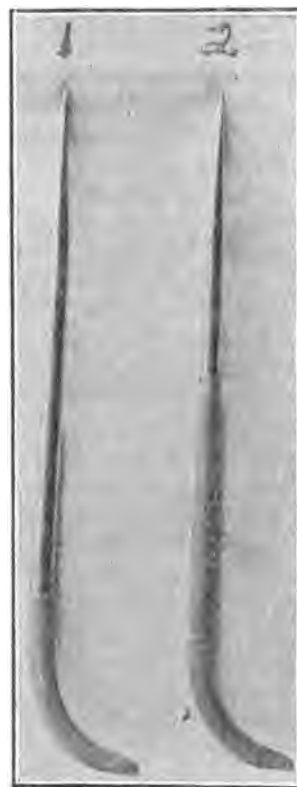
The toxins secreted by gonococci in the protected recesses, glands, follicles, etc., may pass out into the urethral canal and keep up a persistent discharge, and yet no gonococci can be found unless the urethra be massaged on a sound or an acute inflammation be set up by silver nitrate solution. Granular patches and points of congestion also keep up the discharge as well as the narrowing of a stricture and the inflammation back of it. Passing sounds too early may be a potent factor in keeping up a discharge ; strong irritating injections may also act in the same manner. Normal narrowings in the urethral canal and cachectic conditions of any kind, as tuberculosis, syphilis, diabetes, Bright's disease, rheumatism, etc., act as predisposing causes.³ The gonococci usually disappear after 2 or 3 years,⁴ but are rarely active after 8 or 10 years, unless there are frequent recurrences.

Duration of the Contagion.—"If we were asked to

define the most characteristic trait of gonorrheal infection, we would be obliged to say its tendency to persist and recur,"⁵ but upon this point there is great diversity of opinion. Finger requires the absence of gonococci, pus corpuscles, and periurethral complications before allowing patients to marry. Noeggerath takes a gloomy view of the subject and thinks that if a man has once had gonorrhea he never fully recovers. Keyes is more liberal and allows his patients to marry when there is a prolonged gleet of unknown origin, if no gonococci are present, and he believes it has a beneficial effect upon the discharge. Finger believes the newly-formed epithelial cells growing from the deeper layers carry the germs to the surface, and in this way tend to throw them off unless there is an acute attack and invasion again of the deeper layers. White and Martin say it is safe to forbid coitus as long as gonococci can be demonstrated in the artificial acute cases from strong injections. The retention of a full-size sound 15 minutes, with massage along the urethra and of the prostate, will usually aggravate the condition when gonococci are present if no attempt is made to destroy the organisms expressed from the follicles and they are left in the urethra. Two or three bottles of beer usually increase the discharge to be examined. A patient should never be allowed to marry if gonococci can be found in the discharge, or in the secretions massaged from the prostate, or in semen collected in a condom during coitus.

Pathology.—The lesions usually appear as "intense congestions, excoriations, granulations, epithelial thickenings, papillomas, follicular and lacunar involvement, or infiltration of the submucous periurethral connective tissue, resulting ultimately in a stricture."⁶ There may be a general leaky condition of the mucous membrane, due to some systemic weakness without any point of localized inflammation.

The most frequent cause is the glandular involvement with an exudate thrown out around the gland. Finger believes "chronic gonorrhea is essentially chronic inflammation of the subepithelial tissue, which passes through two stages, that of infiltration and that of contraction." Gouley says, remembering that a chronic mucopurulent discharge is nearly always a sure indication of the existence of a granular urethritis, which is the formative stage of certain strictures, the surgeon



1. Sound prepared with ointment of solidified cocoa butter for the deep urethra. 2. For treatment of the entire canal.

should direct his attention to its cure; if this is accomplished there will be no stricture. All authorities agree that recent strictures can be cured by dilation, therefore I claim that the treatment with medicated sounds not only cures the persistent discharge, but will at the same time be attacking the worst complication that could arise, which is a stricture. The follicular involvement which is also constant in these prolonged cases, and which is so often the starting point of a stricture, can be massaged and the follicles freed from their secretions and filled with the ointment. The massage and pressure are undoubtedly the most efficient means of removing the submucous and perifollicular exudate. This digression into the treatment is to emphasize the pathologic points that are to be considered in the management of these cases, hoping that I may more deeply impress the importance of doing something for these patients, instead of allowing them to continue an astringent injection, or irrigation, taking balsams, etc., until a stricture develops, with all its far-reaching effect. The epithelium of the urethra proliferates and degenerates, the cylindric form changing to the squamous. The favorite seats are the posterior urethra and the bulb. The inflammatory process may be limited to the anterior or the posterior urethra, but usually involves both. The epididymis, prostate, seminal vesicles, and bladder may be affected.

Symptoms of Anterior Urethritis.—There is nearly always a history of recurrent attacks without sufficient reason. A slight discharge of mucus or mucopus is generally present, but may be of so small a quantity that it is only seen as the "morning drop." There may be only a stickiness at the meatus, and yet the presence of shreds will show conclusively that the anterior urethra is involved. The discharge usually appears thin and watery, or whitish in color, until an exacerbation is brought on and it becomes more profuse, yellow, and thick, clouding the urine. Microscopically, it now shows large numbers of pus cells, desquamated epithelium, intracellular gonococci, and other organisms in varying numbers. Shreds are invariably present in the urine, and are usually in proportion to the inflammation, and their decrease and final absence is a much better index of the progress and cure of the disease than is the discharge, for they persist long after the discharge has ceased. The shreds are analogous to the mucus that collects in the nasal cavities or to scabs which form on lesions exposed to the air where the serum and debris dry, but in the urethra they are washed out by the stream of urine. Their character varies from pure mucus, which appears clear in color, often long and float near the surface, to those loaded with pus, which readily sink to the bottom. Under the microscope they show mucus, pus cells, epithelium, gonococci, and other organisms, and should always be carefully studied in determining the diagnosis, prognosis, and treatment. There is usually some redness around the meatus, and slight burning may be felt on urination.

The symptoms of chronic posterior urethritis are unfortunately more or less vague and indefinite in mild cases, and it is these that are most dangerous in carrying the disease to innocent wives. If the urethritis is limited to the deep part of the canal there will be no

discharge, not even a "morning drop" to warn the patient of the danger.

There is nearly always a history of recurring discharge of a varying degree of intensity, from a mild acute attack to a mere drop. These recrudescences are likely to be set up by alcoholic and especially venereal excesses, and usually yield promptly to treatment, the patient thinking many times that he had contracted a new attack.

There may or may not be frequency of micturition, which increases with the degree of urethrocystitis. The desire to urinate is often imperative and may be associated with pain in starting or completing the act. This may be a severe burning with more or less straining to expel the final drops. If there be an acute exacerbation and the inflammation is marked, a drop of blood may be squeezed out of the congested verumontanum by the muscular contraction.

The involvement of the sexual function is variable, and as a rule, but is not always, in proportion to the depth of the inflammatory process and the extent to which the prostate is involved. Ejaculations may be either premature or unduly prolonged or attended with pain. The normal sensation may be lost or altered. So extensive is the nervous connection of the deep urethra and so depressing and widespread are some of the symptoms that it may be well considered the *solar plexus* of the pelvis. Pain may be felt in the lumbar or sacral region, down the thighs, above the symphysis pubis, or back toward the rectum. These pains may be mild and intermittent, or dull and "uneasy," or neuralgic in character.

Mental depression and neurasthenia are frequently seen, especially if nocturnal emissions are frequent. Indigestion, constipation, disturbance of the general health with a loss of flesh are found in severe cases.

Diagnosis.—The histories of these cases are usually characteristic; shreds in the urine constantly; a slight discharge if the anterior urethra is involved; no discharge if limited to the deep urethra, but recurrences are caused from alcoholic or venereal excesses when the patient thinks perhaps he is well. The discharge and shreds should be examined microscopically and stained for gonococci. In reaching a diagnosis not only locate the trouble, but determine if possible the cause of its persistence, as a urethral constriction, involvement of the prostate, or any adjacent structures. The anterior urethra is irrigated with a methylene-blue solution and part of the urine is then passed into one glass. The prostate is now massaged, avoiding the seminal vesicles, and the remainder of the urine is passed into two glasses. (Pyramidal-shaped glasses, held in a grooved block with their square rims in close apposition, to facilitate the collection of the urine in several portions, are preferred.)

If only the anterior urethra is involved the urine will contain no shreds after the irrigation, but if the deep urethra is affected the first glass will contain unstained shreds. Comma-shaped plugs, with shreds, pus, and an excess of phosphates after massage, indicate prostatic involvement. A bulbous bougie is to be passed and any constrictions, tender points, or other abnormalities noted. A microscopic examination of the discharge

brought out on the shoulder of the bulb is made. If the discharge has been persistent and ordinary treatment has failed, the canal should be explored with the urethroscope and a search made for congested or granular spots, etc.

Some of the cases have a persistence of shreds, but with symptoms so mild that frequently they are not noticed until perhaps a complication, as impotence or prostatitis, calls the patient's attention to these organs. Usually the sexual and urinary symptoms are well marked and point immediately to the deep urethra, although undoubtedly many of these patients are treated for cystitis by careless observers who do not examine the urine in several glasses, which is so simple and yet very important.

Prognosis.—The time required to cure a chronic urethritis is usually in direct proportion to its duration and the complications. It is well never to promise to cure a patient in any given time, for there are so many factors under his control that may not be properly carried out, and then the surgeon is censured for failure to cure in the specified time. The average time for an uncomplicated urethritis is from 3 to 10 weeks. Occasionally, however, there will be found intractable cases, disappointing to both the surgeon and the patient.

If a stricture is beginning to form or is the actual cause of the discharge, the prognosis depends upon whether or not the surgeon realizes the importance of adopting a line of treatment to eradicate the inflammatory exudate while it is recent and soft. If it has undergone complete organization the prognosis as to the discharge is greatly altered and it depends upon the curability and complications of the stricture. This is the most serious condition that could arise from a chronic anterior urethritis, and yet it is often completely ignored in the management of these cases.

If the deep urethra is involved all the factors in the case must be considered, as the age, general health, complications—as prostatitis, cystitis, condition of the kidneys and ureters; and here also is the question of stricture of great importance, and the success depends upon attacking both simultaneously, as well as any other complication, if a prompt and permanent result is desired. The complications rather than the urethritis determine the prognosis. Dissipation, excesses or irregular treatment will always prevent a satisfactory result.

Treatment.—No routine treatment can be used with these patients, but it must be selected after a careful examination of the anterior and posterior urethra and a consideration of the previous history and treatment. The social condition, habits of the patient, and his general health are all important. The possibility of a stricture being the cause of a persistent discharge or the danger of the gleet resulting in a stricture must always be borne in mind.

Fresh air, moderate exercise, nourishing but non-stimulating food, plenty of plain or lithia water, are essential. If the patient has been overtreated the discharge will often cease if all treatment be stopped and the digestion and urethra allowed to become normal.

Wine may be taken during meals, but effervescing drinks, as beer and champagne, are not to be allowed.

Excessive sexual indulgence and excitement are always harmful. The bowels must be regulated by aperient waters, magnesium sulfate, lapactic pills, or sodium phosphate, as preferred or found most effectual. Hot enemas may be useful in certain cases, especially when there is a tendency to an irritable condition of the bladder, if used in conjunction with hot sitz baths. Balsam copaiba and oil of santalwood should be given, 0.3 cc. (5 m.) each, in capsules, three times daily, when the discharge is purulent, or 0.3 cc. to 0.6 cc. (5 m. to 10 m.) of oleoresin of cubebs three times daily if the discharge is clear and mucoid and a more stimulating action is desired.

In selecting remedies the milder ones are to be used first and the more radical measures adopted later. For an uncomplicated anterior urethritis with only a slight mucopurulent discharge or a "morning drop," one may start the treatment with injections three times daily of a weak astringent solution. As to the strength of the solution, Keyes says it is desirable in most cases to produce a warm prickling sensation, which may become uncomfortable for a moment or two; but a positive pain generally means that some chemical violence has been done to the surface of the urethra, and such violence may be the starting point of a stricture by prolonging the inflammation. It is only by the abuse of injections that harm results, for properly used they are very valuable in the treatment of gonorrhea, both acute and chronic. They should be given two or three times daily and the meatus held together when the syringe is removed and the fluid retained five or ten minutes.

Among the most useful astringent solutions may be mentioned zinc sulfate 0.30 gm. (5 gr.) to 30 cc. (1 ounce) of water; lead acetate 0.30 gm. (5 gr.) to 30 cc. (1 ounce) of water; hydrastin muriate 0.30 gm. (5 gr.) to 30 cc. (1 ounce) of water; or thallin sulfate 1.20 gm. (20 gr.) to 30 cc. (1 ounce) of rose-water.

The strength of these should be increased gradually and the patient instructed always to dilute any injection that causes pain. If, after two or three weeks' trial, the discharge still persists, hot irrigations may be given daily of mercuric chlorid 1-15,000 to 1-5,000, or silver nitrate 1-10,000 to 1-8,000, or potassium permanganate 1-10,000 to 1-5,000. In case the deep urethra or bladder is involved, these irrigations may be forced back into the bladder by increasing the pressure and at the same time having the patient relax the compressor urethræ muscle by attempting to urinate. If this cannot be done easily, a short soft catheter is passed beyond this muscle and the bladder filled and emptied several times. This treatment, unless counterindicated, may be continued for two or three weeks, and if shreds and a discharge, or shreds alone, are still found, the sound covered with solidified ointment containing 0.30 gm. to 0.60 gm. (5 gr. to 10 gr.) of silver nitrate to the 30 cc. (1 ounce) of cocoa butter may be introduced every other day or every third day after the passage of the cold sound. The interval may have to be increased if the reaction from the treatments is excessive.

The urethra is to be massaged along the sound to express the secretion from the follicles and to force into them a small quantity of the ointment. The cold and

pressure of the sound, in addition to the massage, have a stimulating effect on the absorption of the exudate beneath the mucous membrane and around the inflamed follicles which is very beneficial.

Irrigation may or not be given before these treatments, as the symptoms indicate. They are useful in certain cases to supplement the treatment with medicated sounds, especially if the bladder is inflamed. When the condition is limited to the anterior urethra, or if there is a discharge, the astringent injections, three times daily, held for five to ten minutes, afford a valuable adjunct to the treatment with medicated sounds.

This treatment, with sounds covered with solidified ointment, if used in the management of persistent discharges, is the most efficient means of preventing the worst complication that could arise, that is a stricture. All authorities agree that these soft, recent exudates may be absorbed before organization is complete, therefore the most rational treatment for a prolonged discharge is by this method. This exudate is usually most abundant around the follicles and, as the ordinary treatment has very little effect upon this deep infiltration, or the inflammation of the follicles, we have still further reasons for adopting this as a routine treatment of these cases. It is not to supplant but to supplement the other remedies.

If the symptoms do not yield, an endoscopic examination must be made and the congested and granular patches are to be touched with a 1% to 10% watery solution of silver nitrate, or equal parts of iodine tincture and pure carbolic acid, once or twice a week, with a small amount of cotton tightly twisted on a "barbed" applicator.

When the deep urethra is involved the cold and medicated sounds are useful to allay the irritability of the verumontanum and the inflammation of the prostatic follicles. Here particular good is derived from ointment of lanolin 32 gm. (1 ounce), glycerin 32 gm. (1 ounce), containing 0.3 gm. to 0.6 gm. (5 gr. to 10 gr.), silver nitrate, deposited in the posterior urethra daily or every other day with a Tomasoli ointment carrier.

A valuable remedy in this region is the instillation of 1% to 3% silver nitrate (in water) by using the long curved syringes; 1.3 cc. to 2 cc. (20 m. to 30 m.) are to be injected just beyond the compressor urethra muscle. The bladder should contain a small quantity of urine to neutralize any surplus that might flow into it. (This increases to a marked degree the symptoms, if the condition is tuberculous.⁴) All the symptoms are made worse for a time by the acute inflammation, but when the condition subsides some of the chronic inflammatory products are absorbed, and by a succession of instillations the parts finally become normal. The reaction which follows the use of the sounds is somewhat analogous to this process. If the prostate is inflamed appropriate treatment must be directed to it, as well as to any other abnormal condition.

CONCLUSIONS.

1. The worst complication that is likely to follow a chronic urethritis is a stricture, consequently this should be borne in mind during the entire treatment.

2. The pathology is essentially a chronic inflammation of the subepithelial tissue (and especially around the follicles) which passes through two stages, that of infiltration and that of contraction.

3. All authorities agree that these soft, recent exudates may be absorbed before organization has set in. The most rational method of forestalling a stricture is by the treatment of these conditions with the medicated sounds.

4. The ointment may be massaged into the follicles and depressions where the germs are protected from irrigations and injections. The exudation thrown out around these follicles is frequently the starting-point of a stricture.

5. No other single treatment combines so many beneficial factors, *i. e.*, dilation, cold, massage, and medication uniformly applied to the entire membrane and depressions.

6. The extensive nervous connection and the widespread symptoms that result from injury or disease of the prostatic urethra justify its being called the solar plexus of the pelvis, and many vague indefinite pains, symptoms, and sexual weakness may often be relieved by the proper medication of this part of the urethral canal.

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THE PRACTICAL SIDE OF MOSQUITO EXTERMINATION.¹

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In essaying to discuss such a theme, it must not be understood that the purely scientific side is to be subordinated or imagined to be of less importance than the practical. On the reverse, the methods under which practical work has been successful are based entirely on the scientific work of the entomologists. It is through their patient labor that others have been encouraged to carry into practice their findings to their legitimate results. The scientific work of the bacteriologists, too, has given great strength to the demand for practical work.

Without diminishing their share in the movement it may be truly said, however, that entomologists have always known the fact that the mosquito must have water in which to develop from the larval and pupal stages to the adult. But, as is very generally the case, these students have been, in former years at least, engrossed with the study of the life, habits and structure of these pests and did not carry, and indeed were formerly hardly expected to carry the knowledge gained into the practical realms of extermination. They may be said to have been working at too close a range to see all the results which their knowledge implied. There was needed the more general survey over the entire sub-

¹ Read before the American Association for the Advancement of Science at the New Orleans Convention, December 29, 1905, to January 4, 1906.

ject by practical minds of persons who knew, perhaps, only the basal facts about these pests to bring about a great reform. Just as in the case of some one who confines his attention closely to his line of business, another in a different line will see opportunities of extension and profit which his closeness of application precludes. Thus there has grown up a profession of men who go from one business house to another more thoroughly practicalizing businesses of which they before knew little or nothing.

In this case, exceptionally, the suggestion of relief came from Dr. L. D. Howard, who combined both the student and the practical mind, and by his experiments and announcements brought hope that practical extermination on a wide scale was possible. And when Dr. Howard saw that there was even a broader and more radical relief possible than the use of oil (which idea he discovered to be of great practical though limited results), he was the first to encourage the broader idea of drainage when he observed this plan urged in the scientific press, as it was nearly seven years ago, and it was he who gave the necessary inspiration and encouragement to practical men who were interested. The death-knell of the mosquito then began to sound when this entomologist inspired the carrying into effect of known resources of destruction. To use a bull, some concluded that the best extermination method was to destroy the mosquito before he was born, and he endorsed the idea.

The world has moved toward practicalizing scientific knowledge rapidly in the last few years, and this matter thus early fell into line. The mind of the entomologist who forcefully recommended the larger use of oil as a remedy was simply going a step beyond his real field and applying his knowledge to practical uses, which should be the object of all scientific study and not the thing *per se*. And then this line of thought inspired the idea that if oil was good in a limited way, why not go further and to the root of the matter and destroy the breeding places. The seed-thought, however, had been dropped some time before, when a casual remark had been made that a certain place, before experienced by this speaker as unendurable, had been cleared of mosquitos by a piece of commercial drainage, but it was the work of the entomologist, as before stated, to nurture the idea to fruitage.

So when plain, practical men, who knew little of entomology, saw that water was needed to develop the pest, they were just so practical, or unpractical, if you please—such visionaries—as to say, let us do away with all water in inhabited sections where the pests breed. They simply put two and two together, while heretofore these factors had been widely separated. And so widely and so long were they apart that when the union was proposed the world laughed aloud, and a few of a certain caliber of mind are laughing yet.

There has been many a great idea retarded for ages because of this spirit of ridicule, and many a man has gone down under such opposition who had a thought which, if encouraged, would have blessed mankind ages before its final acceptance. We can all think of instances of this. Insistency often has been lacking.

But, fortunately, the mosquito cranks were as persistent as the pests themselves. They kept at the sub-

ject until they reversed the universal practice and they themselves began to draw blood. And so, probably, no crusade, which at first seemed so chimerical, ever made such strides as has the mosquito crusade in the last three years or so, until now that which less than a score of years ago began as an oiling experiment in a summer resort in the Catskills has spread to a crusade of drainage, filling, and the like; and oil, which is indispensable in certain limited conditions, is now largely supplemented by extensive engineering operations. Now engineers of national reputation are applying the solid foundation laid by scientists to their work and urging broad remedies upon communities and cities which have been sadly injured by the mosquito nuisance.

In a report (1903) on the improvement of a river in New England, an engineer, whose abilities have brought him large projects in many sections of the country, makes the mosquito, and hence the malaria question, one of the moving causes for a proposed improvement. He calls to his aid a Harvard pathologist of world-wide reputation, who devotes many pages of this report to the mosquito question.

And in 1904 the same engineer reports on the improvement of another river and gives prime attention to the results of investigations by the scientific experts from the Massachusetts Institute of Technology. Based on their reports, he is led to state: "The results of this inquiry were startling. Every physician who was consulted testified that malarial disease was already prevalent and that it was apparently increasing and slowly extending." He says: "I was thus obliged at the outset to face a great sanitary problem which for the time overshadowed the other studies, for questions of public health are paramount and should have precedence over landscape design and facilities for brickmaking or market gardening." We may interject just here that when health and all improvements go together, as can be planned, then is the greatest good accomplished. The experts speak of 700 acres of a fresh pond marsh section (300 of which is constantly wet and soggy), where "physicians report that every person in every house has had the fever," and many of them state that this "is the most dangerous section in 25 miles." While the poor who live in this swampy territory were mostly affected, the report shows the disease spreading into the best districts where it is hilly.

These lines of investigation and the results are in exact conformity to the work done and reported upon by the North Shore Improvement Association, of Long Island, some years previously. And it is most encouraging that engineering works are now being undertaken with such a strong appreciation of the importance of the mosquito question.

Landscape architects are seeking informing literature and are studying the subject and discovering that their profession also can materially aid the crusade and are recommending plans with a view to this question.

These two professions have been sadly blind to their opportunities for good. Not only has their work been simply negative—that is bad enough with their opportunities—but they have actually aided breeding in most cases. Within a few days I have interested an owner in

a badly infested home-site, who has been spending thousands of dollars in following the plans of eminent landscape architects as to lay-out of wide lawns in front of his dwelling, while just in the woods behind there has existed for ages, and still exists, a breeding place extensive enough to ruin the pleasure which his home should yield him, and a surplus of pests to curse his neighbors. Now, this man is moving vigorously to get rid of this pest place, not that it has not been known heretofore that mosquitos would breed in such places, but solely because it has been demonstrated that such work is entirely practical and certainly is highly desirable for comfort, for health, for increase in the value of his property, and in the vast improvement to scenic effects. This is not simply a case of neglecting a grand opportunity, but when these professions actually produce breeding grounds, their acts become a positive wrong to the public.

A gentleman of large means, recently met, has been encouraged to work on these lines on his vast property and now assures me that he considers the question one of the most far-reaching before the people. This we have been endeavoring to show for nearly a decade. He feels that no money he is spending on roads and other improvements will pay him better. He also assures us that in the immediate vicinity where he has done work, which this crusade encouraged, he plainly notices a great difference in the number of pests and he is going to continue the work with vigor for its absolutely paying results.

A little town in New England of less than a thousand inhabitants, the chief industry of which is fishing, has recently become impressed with hope, founded on experiences elsewhere, that something might be done so that its thousands of acres of breeding grounds might be redeemed to agriculture, its desirable building sites relieved from the curse of mosquitos which has always existed, and thus its lands become habitable, its taxable valuations increased, and the town be greatly benefited. Inspired to join the crusaders, it had been working in a limited way and found excellent results but it is now in a movement for raising and expending a large sum of public money to carry out very radical plans recommended to make these benefits assured.

A gentleman who bought a beautiful and extensive estate with the ban on it that no one could live on it in July and August, was impressed with the antimosquito theory, and made his large tract one without mosquitos. His success led him naturally to wish others to be blessed likewise and he was instrumental in a campaign of greater proportions. One in this wider territory wrote to me within a few weeks that the success of the work was still continuing, although four summers had passed; and a person in another State has stated within a few days that he was visiting in the district in question this season and went through parts which he knew once to be infested beyond human endurance, and he did not raise a mosquito. So much for the lasting effects of work thoroughly and practically executed.

But I am sure I do not need to rehearse smaller instances when all know of the transcendent achievements

of Dr. Gorgas, both in Havana and in the Panama Zone, almost entirely as the result of practical mosquito extermination. Nor do you need to be reminded that the practical work of this kind in New Orleans, first under Dr. Kohnke and others, and taken up later by the general government with all its prestige and power, through its Public Health and Marine-Hospital Service under Surgeon-General Wyman, with his able corps of specialists all working against the mosquito—that *this* brought about the end of the scourge of yellow fever here this season without the aid of frost, and has added to the demand that this scourge and its attendant ruinous results to commerce, through quarantine, be treated solely as a mosquito proposition and not as an inscrutable order of Providence. I well recall the force with which Dr. Kohnke at the second convention of the American Mosquito Extermination Society urged the necessity of screening the cisterns of New Orleans and spoke of his efforts to compass this legally. But his warning was acted on too late. He was then ahead of his time, but we are glad to say he is not now.

The demand is simply: Stop breeding mosquitos and stop it by practical measures—no chimerical plans—nothing but what a child may comprehend. But do it thoroughly—do it so that results will last. Abolish forever the breeding places and be careful not to make new ones. Communities should furnish money as they would to build a fine road—as is often the case, \$10,000 a mile through a mosquito-infested section—and do it before building the road, and then the road, when built, can answer its full purpose of comfortable travel and traffic.

How much is the quinin bill of the country? And who can estimate, beside, the sum of the misery and loss from malaria? Who will compute how far the loss in a yellow fever epidemic would go to make everything safe along practical, common-sense lines? Is it not a fact that the expense of tardy work and the indirect and direct commercial losses resulting from this season's experience would easily have paid for New Orleans' exemption? How long are we to suffer these evils and pay the enormous and wretched penalty before people will arise and demand that this great crusade shall have complete course? This age is not the time to say that the work is too great. Put a year's loss and the cost of remedies the country over into the crusade, and it will be a paying investment financially not to include other considerations. But again, do it thoroughly, so that you will not have to come back again in another year, or in ten years, for more money. Otherwise you have set back the cause for years. Note the radical work which the general government is doing in Panama and which it considers as necessary in every way before work is fully put under way. We said a year ago that the government could well spend \$1,000,000 to make the zone safe. This sum has been spent already and results will justify the outlay many, many times. Chairman Shontz, of the Isthmian Commission, in an address last month expressed the well-grounded hope that yellow fever, that supreme terror of the tropics, was extirpated, never to return again to Panama. Can one conceive all that such a statement means in relation to the cost and humanity of this great work?

Assistant Surgeon-General Gorgas, in his report dated November 9, 1905, just to hand, reports that of the 22,000 employes during October, of which 4,000 were nonimmunes, there was but one case of yellow fever and no deaths. He pertinently contrasts conditions for the same month in the Zone now and under the French régime before the mosquito theory was known. Then there were reported 21 deaths and 84 cases, and many of each were not reported. Now he has care of one-third more of the nonimmunes and there is only one case. He maintains "the results are solely and entirely due to the sanitary measures put in force." He has an *Anopheles* brigade reporting thousands of feet of ditches dug and cleared and other remedial work; and a *Stegomyia* brigade reporting and remedying tanks, cisterns, barrels, and other breeding places. To overcome the dangers from these pests which get to wing, he has a *fumigating* brigade, reporting houses fumigated containing 12,000,000 cubic feet, using 18,000 pounds of pyrethrum and 7,800 pounds of sulfur. Dr. Gorgas finds a steady decrease in cases of yellow fever under this work while there is a steady increase in the number of susceptible persons. He considers the sanitary question in Panama settled—that the largest necessary force of laborers can work there without suffering from yellow fever and that "the general health can be kept as good as if they were digging a canal in the healthy part of Maryland." Now all this you may hear stated by others, but bear in mind it is the practical side of mosquito extermination we are trying to emphasize, and this is all practical and highly profitable in every way and well bears repetition. Also recognize that to some extent, such work is necessary in many communities in the States and that it is just as profitable here in a humanitarian view as a financial proposition and in other aspects.

No progressive man will object that the general government is spending hundreds of millions on good roads, on irrigation, on river and harbor improvement; that the empire State votes 150 millions for good roads and canals; but when it is considered that in some of these cases the benefit will come only to sparsely settled sections and result in aiding comparatively limited areas and valuations, the thought arises why should not some of these vast sums be used in blessing the country by driving out the mosquito and malaria and yellow fever, bettering the condition of the less favored people—for they suffer most—changing marsh and swamp areas into places of fertility, beauty, and oftentimes into places of pleasant habitation. When it is considered that such work is largely needed in close centers of population, where thousands will be benefited instead of scores, and where resultant increase of tax valuations will shortly entirely repay cost, the urgency of the subject as a public work is manifest. This body and all others working for the general good should state and reiterate this position until we get public action.

It has taken some years to get strength in the idea enough to obtain appropriations, but these are now coming in many places. Numbers of cities and communities are awakening and acting. The Department of Health of the city of New York has been expending

this season in one borough, Richmond, an appropriation of \$17,000 under Dr. A. H. Doty, the health officer of the port, and it is to be hoped the results will encourage work in other boroughs. But all public work particularly, we repeat, should be done most thoroughly, or the press and people will raise such opposition as to cause a setback in the practical work of a thoroughly scientific problem.

The city of New York is also helpfully acting in the reform by utilizing part of its inorganic waste in filling in breeding places, instead of carrying it out to sea and dumping it, so that much floats back onto adjacent shores. In the southern part of the borough of Brooklyn, Coney Island creek is being filled in, which, if guardedly done, will prevent its waters from saturating hundreds of acres of marsh land where mosquitos are now famous. This evil and this benefit was pointed out some seasons ago, when a crusade was initiated there by the late Mr. Wm. C. Whitney.

Some two or three years ago we were greatly encouraged in learning that the Italian Government had made a contract with some German capitalists to drain the great marshes about Rome—to destroy the breeding places of mosquitos, and thus render the section healthy and inhabitable. But it seems that this great improvement and blessing to a race has been kept back until now by the obstruction of a few sporting noblemen (in title) who wished to have the marshes left for their personal pleasure. Now, the press informs us the work is to go forward and the promoters are to be paid in hitherto worthless land. What a suggestion for our country along lines of marsh improvement and the obstruction met from the personal interests of a few seeking pleasure.

The great benefits of mosquito extermination, we feel, are to be accomplished by a careful education of the public mind and a judicious effort for laws and public appropriations, by cooperation of general and State governments, of cities and rural sections, of individuals and public men, in a short, strenuous campaign. What need of taking decades in these moving times? And it is on these lines that the American Mosquito Extermination Society is earnestly working, and I bespeak for it your influence and cooperation.

It would take too much of your time to speak of this phase—the basal work, education—education of the public school children of the country, the law makers, the editors and press writers, the civic organizations, the professions interested, the great mass of the people. But this work our Society is striving to do and has its members distributed well over America, to whom our literature is scattered, and we frequently hear of its bearing good fruit in campaigns. In our society, either as officers or on the advisory boards, are many men of broad influence in the country. Among these the earliest to go into actual work, inspired by the entomologist before referred to, were Matheson, Kerr, Miller, Hoyt, Cravath, Rand, and Wetmore—business men of largest affairs.

We have got such men together, with many others known over the world, into a society which, according to its constitution, seeks "to unite in a general body persons believing in the various great evils resulting

from the unrestrained breeding of mosquitos in civilized sections, and in the practicability of their extermination therefrom by private and public systematic operations."

For these worthy objects we ask your active cooperation, and in closing thank you for your attention.

THE EFFECT OF POSTURE ON CARDIAC AND VASCULAR MURMURS. *

BY

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The influence of different postures upon the various bruits, which occur in the circulation, and which we are constantly listening to in the course of our daily work, is often very marked. It frequently strikes one as peculiar that so little notice is taken of such an obvious fact. Some writers make scanty allusion to it, while many pass it over in silence. Yet again, others make statements about the subject which are hard to understand. For example, Potain taught that all murmurs, which almost or entirely disappeared when a change was made either from a sitting to a recumbent, or from a recumbent to a sitting posture, were cardiopulmonary, *i. e.*, were produced in the adjacent lung substance by the movements of the heart, and not within the heart at all. This, in spite of the eminence of the source from which it emanated, is, as Dr. William Gordon says, almost certainly an error.

The murmurs, which are most markedly influenced by change in the posture of the individual examined, are, generally speaking, the so-called functional ones, but organic bruits by no means always escape.

In studying the influence of posture on murmurs, one must avoid possible sources of error. The effects of the muscular movements made by the patient in the act of assuming the different postures can be canceled by allowing him to remain in the new posture for a short time before examining him.

Cardiopulmonary bruits can probably generally be excluded by noting their large dependence upon respiration, their limitation to the edges of the lungs and their slight degree of transmission.

VASCULAR MURMURS.

Vascular murmurs are markedly affected by posture.

Arterial Murmurs.—These bruits, so often heard in anemia, neurasthenia, and other states in which a relaxed condition of the vascular system exists, are much louder in the horizontal than in the vertical posture. They are best heard over the carotid arteries and are often only audible when the patient is recumbent.

The *venous hum* is also markedly affected by posture, being, in contrast to the arterial one, best heard when the patient is vertical, either sitting or standing. The murmur is loudest generally at the root of the neck on the right side and is exaggerated by the patient turning his head to the left. The tissues on the right side are thus put on the stretch, and probably the jugular vein is thus constricted at parts.

CARDIAC MURMURS.

Pulmonary Bruit.—The very common murmur heard in the pulmonary area and a little below this point during the ventricular systole is very susceptible to changes in posture, in the direction of being made much louder in the recumbent posture. Not only does the bruit become louder, but it is audible over a much more extended area than when the individual is vertical. The murmur is, of course, nearly always functional, and I have again and again heard it distinctly in the recumbent posture when it was not audible at all in the vertical. Dr. A. Foxwell,¹ in calling attention to this fact, was inclined to attribute the increase in the loudness of the murmur largely to the dynamic effect of the change of posture, but as I showed last year,² the rule holds good in patients who have been recumbent for weeks and in whom therefore only the static influence could be considered. A pulmonary diastolic murmur is very rare, and I have been unable to observe the effect of posture upon it, but, arguing from the behavior of the aortic diastolic, it would be little affected.

Aortic Murmurs.—The aortic systolic bruit is influenced in the same way as the pulmonary systolic one, being louder in the recumbent than in the vertical position. At least this is the general opinion and my experience, but Dr. J. A. Lindsay,³ of Belfast, considers that "the systolic murmur in the aortic area, whether functional or organic, is more distinct in the standing posture." The murmur of aortic regurgitation is less affected by posture than is any other, the reason probably being that in the first place there is always probably an organic lesion, and in the second the bruit is produced under such high pressure in any case that the slight effect of posture makes little difference.

Mitral Murmurs.—The bruit produced by mitral regurgitation is usually louder and more widely heard in the recumbent posture than when the patient is vertical. This is specially true of the murmur due to functional causes. As a rule, those of organic origin are also thus made louder, but not always, and several of this nature recently examined specially in this respect, showed little or no change in the different postures. If a mitral systolic murmur changes at all in the recumbent posture (and it usually does so in my experience) then it is generally admitted to thus become more evident, but I find that Dr. R. H. Babcock,⁴ in his book on heart disease, writes as follows: "The position of the patient's body also influences the audibility of this (mitral regurgitant) murmur. It is in most cases heard most plainly when the patient sits or stands, but I have frequently seen cases in which it came out far more distinctly in the dorsal decubitus, which permitted the heart to beat more forcibly because more slowly. Consequently, it should be an invariable rule to auscultate in a suspected case of mitral insufficiency, and, indeed, in any suspected case of cardiac disease, in all three positions (standing, sitting, and lying). It will often protect one against a serious blunder in diagnosis." I fully agree with Dr. Babcock's conclusion, but not at all with his premises, for most decidedly in my experience and in that of all others whom I have consulted, if a mitral systolic murmur is affected at all

* Read before the Canadian Medical Association at Halifax, N. S., August, 1905.

by posture (as it so frequently is), then it will be louder in the recumbent than in the vertical posture.

The mitral presystolic (auriculosystolic) bruit is generally affected to some extent by different postures, being loudest in the vertical posture. This is very generally recognized, although exceptions occur in literature. It is, however, much more strongly brought out by exertion, as when the patient walks hurriedly or sits up in bed several times rapidly, than by any mere change in posture.

Tricuspid Murmurs.—Systolic tricuspid bruits are increased by the recumbent posture, as are the systolic mitral ones.

The rare diastolic tricuspid bruits probably would act in response to posture in the same way as do the presystolic mitral ones, but I have not had a chance of testing this.

Thus, as regards heart murmurs, the general statement may be made that all ventriculosystolic bruits, if affected at all by posture (and most of them are), are loudest and most extensively audible when the patient is in the recumbent posture. On the other hand, all murmurs occurring during the ventricular diastole (if affected at all by posture) are loudest in the vertical position.

All writers upon this subject are agreed that functional murmurs are much more affected by changes in posture than are those due to organic disease. Dr. James F. Goodhart, in order to emphasize this point, would even go further, and in a recent Cavendish lecture said that he would venture to change the name of many of them from the old one of "functional" to that of "postural." With all deference to so eminent an authority, I would scarcely go so far as this, for, although many of these functional murmurs can only be heard in the recumbent position at times, they may often be brought out in the same patient when in the vertical posture by any physical or other excitement, and thus to call them "postural" might lead to confusion. Again, I think that occasionally one may make out a murmur due to organic disease only when the patient is recumbent, and to label such a case as postural, suggesting a functional character, would be apt to tend to error.

In looking over the literature of the subject some statements appear that are hard to understand, as, thus far, the matter under discussion is one of observation of facts and in no way theoretic. Dr. O. B. Campbell⁵ writes: "Dr. Paul Guttman says that all murmurs are louder when the patient stands than when he sits or is recumbent. I now wish to say that nearly all murmurs are louder when the patient is recumbent than when he is sitting or standing. According to my own observations, 78% of murmurs are louder in the recumbent posture." I think most observers will fully agree with Dr. Campbell's general statement; and it seems scarcely possible that he can have quoted Dr. Guttman correctly as saying that all murmurs are louder in the standing posture than in any other, because they most certainly are not so.

Granting that many murmurs are better and more extensively heard in the recumbent position than in any other and that a few are louder in the vertical posture,

it becomes necessary if possible to account for this phenomenon.

As regards the effect of posture on the vascular bruits, there can be little doubt that this acts through gravity. In the vertical position gravity hastens the flow of blood in the veins at the root of the neck toward the heart and the *bruit de diable* is the result. On the other hand, in the vertical posture, gravity will tend to retard the flow of the blood in the carotid arteries, as the current is then up hill, so to speak, and this retardation lessens the arterial bruit. But in the horizontal position the action of gravity is removed from the blood, and hence the flow is faster and the murmur may develop.

It would serve no useful purpose here to enter into the discussion of the physics of vascular murmurs, but it is beyond doubt that anything that hastens the flow of blood in the vessel will tend to increase any bruit that is being produced.

Looking now at the action of posture on the various cardiac murmurs, we find that several theories have been advanced to account for its effects.

Foxwell suggests that the effect of assuming the horizontal posture in producing a murmur in the pulmonary area may be largely dynamic, the muscular effort of the movement exciting the heart. But I have shown² that these murmurs occur very frequently in individuals who have been for weeks recumbent and in which therefore nothing but the static influence of the change of posture can be effective. And only recently one found on very carefully examining a functional case that the murmur did not appear on the patient *first* assuming the recumbent posture, but did so a few minutes later. The case was that of a girl, aged 10, who seemed well except for a small submaxillary abscess. When she sat up the heart was rapid, beating 112 per minute, and there was no pulmonary or other murmur; on lying down the pulse fell to 90, and at first there was no murmur, but slowly a wellmarked pulmonary systolic one developed and persisted. This postural test was applied again and again with the same result. Evidently it was the horizontal position and not the muscular action necessary to reach that position, that was the cause of the bruit.

W. Gordon⁶ has suggested that the alteration in the shape of the chest that occurs in the horizontal as compared with the vertical posture is an important factor in the better hearing of the murmurs in the former position. Or to be more precise, he argues that the bruits are better heard in the recumbent posture because the heart is then brought nearer to the front of the chest, and hence to the examiner's ear. Using a special pair of calipers, he found that the chest measured anteroposteriorly about one-half to three-quarters of an inch less when the individual was horizontal than it did when he was vertical. I have tried this in a number of cases, both in children and adults, and fully confirm the observation.

Still, Gordon admits that in some cases the anteroposterior diameter does not alter much, and yet a murmur was produced or much increased by a change to the recumbent posture, which would suggest to me that the alteration of the diameter of the chest had little to do with the murmur. Moreover, because the anteroposterior diameter of the chest is less in the horizontal than

in the vertical posture, it by no means follows that the heart is therefore nearer the anterior chest wall than in the vertical posture. On the contrary, it seems from physical examination that the heart is nearer to the front in the vertical than in the horizontal position, for the pulsation is certainly more visible and palpable in the former posture. Further, surely the heart would tend to gravitate away from the anterior chest wall in the recumbent posture, the extra space then being filled in by lung tissue. This is confirmed by careful percussion of the absolute cardiac dulness, this being more extensive in the vertical posture.

I agree with Dr. Lindsay when he says that "the normal heart sounds are louder and more distinct in the erect than in the recumbent posture." This being the case, any abnormal sounds should also be louder; and if a murmur were being equally produced in the various postures it should be *better* heard when the patient is vertical than when he is recumbent.

The alteration in the anteroposterior diameter of the chest is not so great in different postures as it is between full inspiration and full expiration, and yet the effect of posture on murmurs is far greater than is the effect of respiration. In one man we found the chest diameter to be 21 cm. on sitting and 19½ cm. on lying down, and yet on full inspiration it measured 21½ cm. and on full expiration only 18 cm. This is not always the case, however, and in several children it was found that full inspiration rather decreased the diameter of the chest, the sternum sinking slightly, being pulled on, I presume, by the descending diaphragm.

Gordon falls back on the effect of gravity as a great cause of the murmur, and this, to my mind, is the chief if not the only factor which is at all active. There are several ways in which gravity may act. As was mentioned under vascular murmurs, it must, in the erect posture, hamper the flow of blood into the aorta and pulmonary arteries, and also back into the auricles, while in the horizontal position this drag on the flow is removed. Hence, all systolic murmurs are louder in the recumbent posture and all diastolic murmurs tend to be more evident in the erect one. But gravity acts in another way, in that it affects the blood-pressure, and the action of the ventricles against a different blood-pressure in the different postures may be sufficient to increase or decrease the different bruits.

Foxwell, who believes, and I think proves, that the functional pulmonary systolic murmur is largely due to a dilated condition of the artery beyond the valves, thinks that the effect of gravity, acting in the recumbent posture on this special murmur, is accomplished through the following changes: (a) An alteration of the angle between the right ventricle and the pulmonary artery; (b) a removal of the pull of the heart (*i. e.*, its weight) on the pulmonary artery, thus allowing that vessel to dilate more easily; (c) "lastly, as the systemic pressure is lower in the erect than in the supine posture, probably this is true also of the pulmonary circulation; hence, the pulmonary artery and conus would be less stretched in the erect posture."

But the effect of posture on the systemic circulation is different in different parts; thus when vertical the

pressure is lower in the carotids and higher in the femorals than when the individual is recumbent. Moreover, it is not proved that the pressure is higher in the pulmonary artery in the recumbent posture than in the vertical.

But after all, the theory of exactly why posture alters many circulatory murmurs is of little practical importance, while the remembrance of the fact that it does so is of the greatest clinical value. Hence, I would urge that, in every case in which it is considered necessary to auscultate the heart, this examination should be conducted in the recumbent as well as in the vertical posture; and further, in the description of any heart murmur it should always be stated in what positions the patient was when the murmur was of the nature described.

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DISINFECTION OF SHIPS.¹

BY

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The subject of disinfection of ships is such an extensive one, and so much could be said about it, that there will be no attempt made here to enter into more than a review of the measures ordinarily taken. In a general way, ships require disinfection in order to prevent the transmission or spread of disease. More in detail, it would be as follows, *viz.*: First, on account of having arrived from a port infected with contagious or infectious disease. Second, on account of the occurrence of a case of infectious or contagious disease among the individuals aboard her. Third, as a routine sanitary measure to maintain a standard of cleanliness and for the purpose of destroying vermin, etc., thus increasing the comfort of the traveling public and reducing to a minimum the danger of contracting disease of any kind.

Vessels proceeding from a foreign port should be treated at that port. A reliable, live and energetic officer being familiar with health conditions and affairs, is in a far better position to handle a vessel intelligently than is the officer at the port of arrival; also, when all the necessary precautions have been taken, the vessel sails presumably free from danger of conveying disease so far as the vessel itself is concerned; hence the only thing to be feared is that some individual aboard has been exposed prior to embarkation and is at the time in the incubation stage of the disease. However, if the voyage has been sufficiently long and the vessel arrives without having disease on board, it can be considered safe. The advan-

¹ Read at the second annual meeting of the Philippine Islands Medical Association, Manila, P. I., March, 1905.

tages of this method are obvious. The work can be done almost entirely while the vessel is loading and there is a minimum detention to the vessel. This is quite a consideration, as one day's delay to a vessel is a large item of loss to the owners, and when it is necessary to cause frequent and repeated delays, serious hindrance and interference with commerce to a marked extent, result. Further, all suspects or persons who have been exposed to infection, if the steamship agents are notified, are prevented from sailing. Thus another source of danger is removed. The same applies to cargo. All cargo that has originated in infected territory and is of such a nature as to enable it to convey disease is not allowed to be placed on board. Thus, cargo which in itself would be dangerous, and, in addition, might infect other cargo by being stored with it, is kept back.

The method of procedure to be followed at such foreign port would be as follows: When the holds are empty or the cargo is of such a nature that it will not be injured, and is not too closely stowed, the holds and all closed compartments should be fumigated with sulfur of at least 4% per volume strength ($4\frac{1}{2}$ pounds per thousand cubic feet of space), with an exposure of from eight to twenty-four hours. This may or may not be followed by washing out with 1 to 1,000 mercuric chlorid solution, as circumstances indicate. The fore-castle and steerage compartments, however, should always be washed out thoroughly, as soon as the fumigation is completed, first with brooms and soap or lye, for a mechanical cleansing effect; this is to be followed by a thorough wetting of all surfaces with a 1 to 1,000 mercuric chlorid solution. When these measures have been completed, loading may be begun.

The precautions to be observed at this stage are as follows: If the vessel lies alongside a wharf or dock, all lines leading ashore should have inverted cones, or rat funnels, placed on them, to prevent rats from going on board by way of the lines. A useful additional protection is to place thickly tarred canvas around the lines for several feet on each side of the funnels. By means of shores, the vessel should be kept at least eight or ten feet away from the dock, communication to be maintained by means of gangways. These should be taken in at night with the exception of one, where a watchman with a bright light should be stationed. These precautions are particularly useful in plague-infected ports, but they are not bad routine at all times, and are very little trouble. When a vessel loads in the open bay by means of lighters, if she does not work at night, the lighters should be dropped astern and rat funnels placed on the lines, or the lighters anchored.

All bills of lading, invoices, or boat notes of cargo should be submitted to the medical officer prior to loading the cargo. He then passes such articles as are of a nature that is not likely to convey infection, signing with his name and title the aforesaid papers as an indication

that the goods may be loaded, and also to indicate to the health officers at the port of arrival that he has investigated these articles and believes them to be safe. If the articles are of such a nature that they are likely to convey infection, he should satisfy himself by means of manifests, bills of lading, boat notes, affidavits, inspection of the cargo itself as to its nature and manner of packing, and by any other means available that it has not originated in infected districts, or been exposed to infection during transshipment or in warehouses, before the cargo is allowed to be loaded. When the cargo is loaded, the manifest should be checked against the boat notes or other papers to see that there has been no substitution of items, or other attempts to deceive. The manifest should then be signed.

Several hours prior to sailing, the crew and steerage passengers should be bathed and all their effects disinfected by some approved method, and if no plague is present in the port they should be vaccinated. If plague is present, this should not be done, for the reason that the fever attendant upon the "taking" of a vaccination might obscure the diagnosis of a beginning case of plague, at the port of arrival.

Cabin passengers should be required to give a satisfactory explanation as to where they have lived and under what conditions for a reasonable period of time prior to their intended departure. Just at the sailing hour, the officer should board the vessel, inspect all on board, inspect the vessel and the ship's store of food supplies, directing that suspicious articles of food be not taken; then complete the papers and request the master to proceed at once without further communication with shore.

The foregoing sounds like a stupendous undertaking, but in practice, with a methodic and precise way of proceeding, and with the cooperation of the shipping people and passengers, it can all be done in a marvelously short time, with a minimum amount of delay and inconvenience to all concerned.

It is always slow and irksome to institute measures of this kind, but when all are thoroughly understood, and especially when the shipping people learn by experience that they have a minimum amount of disease aboard their vessels, and the delay and inconvenience at the port of arrival are reduced to a minimum, they cooperate all they can, and any objections they may have had in the beginning, if not entirely removed, have become passive at least.

In the event of a vessel having a case of disease on board, the method of disinfection, while aiming at attaining the same end as in the method already described, is necessarily somewhat different on account of different conditions. In the first instance, the vessel was empty, or nearly so, there were no passengers on board, and no cargo or mail to be considered. In the present instance, the vessel has presumably been on her voyage; there are

a number of cabin, second and third-class passengers on board; the holds are full of cargo; there is mail on board. The passengers and crew are in varying stages of mental unrest and disturbance; some have important business to attend to; others are anxious to join friends or family; others are afraid they will be the next victim to the disease that has appeared; others are afraid that the process of disinfection will do them bodily injury, or that their clothing and effects will be injured; others will tell you that they are friends or relatives of some influential person, that the whole proceeding is an unheard-of outrage, and that they simply will not submit to anything, or cooperate, or assist in any way, and that as soon as the arrival of the vessel at the quarantine station is known, a launch will arrive to take them and their effects away. Obviously, this is a time when the proverb, "More haste, less speed," applies, so the first and most important thing to do is to get order out of this mental chaos. Try if possible to get everyone in a good humor, and everything will move along smoothly and nicely, and all will go away from the station satisfied, with a feeling of security derived from the measures taken, with a very kindly feeling towards that extremely unpleasant, dictatorial and disagreeable person, the quarantine officer; and when any of their friends object at any future time to similar proceedings, you would probably be surprised to hear how warmly they will advocate the measures formerly condemned. The first step is to see the case and determine the diagnosis and remove to the hospital of the station. Next, examine all the ship's papers to determine the health conditions at the port of departure, the nature, kind, and quantity of cargo, the condition of the water-supply on board, the condition of the food supply, and any other information that may be contained in such papers. Next, make an inspection of the vessel, in order to gain an approximate idea of the amount of work to be done, and the length of time necessary to do it. Then direct the captain to have the steerage passengers and their effects made ready to go ashore. While this is being done, it is wise to mingle with the cabin passengers and try and quiet their fears, the inspection of the papers, vessel, and case having given one such a fund of information that he may be able to answer all questions and make statements that will help wonderfully in restoring confidence. It is wise to try and find the most influential passengers, those to whom the other passengers will be most likely to listen, and to whose statements they will be most likely to give credence. When these are won over, you need worry no further regarding the passengers, as the opposition shown by the others will only stimulate the ones to whom you have talked to advocate your side, and all will finally be won, or their objections silenced, which is the same in effect.

It is to be hoped that this apparent digression from the main subject will be pardoned. I can assure you,

however, from personal experience that it is one of the most important measures to be taken in any work of this character.

By this time, the steerage passengers and their effects should be ready to disembark. They should be taken to a place as near the disinfecting plant as possible, and directed to unpack their effects and place them loosely in bags. The bags should be numbered and have a check with a corresponding number, to be retained by the passenger. Only clothing and textile fabrics should be placed in these bags. Shoes, hats, rubber goods, toilet articles, books, etc., should be left in the boxes and trunks to be disinfected by a separate method. The passengers then proceed to the undressing room, they divest themselves of all clothing, place them in another bag, leave these bags in the undressing room and proceed into the bath. The clothing left behind is taken to the disinfecting room and disinfected by steam under pressure. In the meantime, the boxes or trunks with articles likely to be injured by steam are collected by attendants and disinfected with mercuric chlorid solution, or taken to the disinfecting room and disinfected in the cylinder with formaldehyd gas. As soon as the passenger has finished bathing, he is given a suit of pajamas to wear until his clothing is returned. Before proceeding to the dressing room where the clothing is returned, the medical officer inspects all persons by examination of glandular regions, palpation and visual examination, using the thermometer when his judgment indicates it is necessary.

In the meantime, the crew of the vessel has been cleaning decks, steerage compartments, forecastles, galleys, etc.

The steerage passengers, when disinfection is completed, take their effects and are conducted to a place of detention. The crew is then taken off and put through the same procedure. While the crew is being treated the passengers are confined to the passenger decks, and the decks, galley floors and walls, forecastle and steerage compartments are washed with a mercuric chlorid solution 1 to 1,000 in strength. This can be done with tubs and brooms, and with a hand pump or any sort of sprinkling apparatus, provided care is taken to wet all surfaces. The crew is now allowed to go on board, but is kept separate from the cabin passengers and their part of the ship. The cabin passengers and their effects, bedding, etc., are then taken off and treated in the same way; the decks, cabin, etc., washed with mercuric chlorid in the same manner as the other parts of the ship. To the water tanks are added sufficient potassium permanganate solution to make a 1 to 1,000 or 1 to 2,000 solution. This is allowed to stand as long as possible and thoroughly agitated in the tanks by pumping from one tank to another, or by any other means that may suggest itself. After a proper interval, it is all pumped out, the tanks rinsed with fresh water

and refilled. The food supply is examined and any suspicious articles destroyed. This in general is the method followed in a case of cholera. In the event of smallpox, all living apartments are fumigated with formaldehyd in addition, with at least 12 hours' exposure. The gas should be generated in some form of autoclave and conducted into the apartment with considerable pressure behind it. If the disinfection is on account of plague, sulfur is the best agent to use, and all closed compartments of the vessel should be fumigated, including holds and engine rooms. If the ship has cargo, the holds should be given a preliminary fumigation with sulfur, and a certain amount of cargo unloaded, a layer equal to six or eight feet in depth; a second fumigation practised and a second unloading, and so on until the unloading is complete, when a final fumigation of 18 or 24 hours' exposure should be done with as high a percentage of gas as it is possible to obtain, followed by thorough cleaning with mercuric chlorid of the entire hold, with a thorough search for dead rats, vermin, etc. Sulfur is preferred as the agent to be used for the fumigation of a plague-infected ship on account of the greater certainty of destroying all vermin on board. Formaldehyd has been found to be unsatisfactory for this purpose.

Sulfur has the disadvantage of injuring fabrics, metal work, etc.; therefore all such things should be removed and handled in other ways. Those that are fixed and cannot be removed may be covered with a heavy coat of vaseline, white lead, or some heavy oleaginous substance, which can be removed later.

If the passengers are to be detained for the incubation period of the disease, they should be placed in buildings, or tents if no buildings exist, and the crew returned to the ship. The crew must be returned to the ship in order that no harm may come to it from storms or other causes.

The routine sanitary measures to be followed for the purpose of maintaining a standard of cleanliness, and to keep vessels in a good sanitary condition, are as follows: Every six months, the vessel should be fumigated with sulfur. This can be done at any time that the vessel is empty, the agents notifying the quarantine officers of the hour the last cargo will be discharged. Sulfur can then be placed in all closed spaces and allowed to remain about eight hours. At the end of this time, open up and make a thorough search for rats and other vermin; directing these to be burned in the ship's furnaces. After the fumigation, carefully inspect the entire ship; show the master where improvements are needed; advise painting of forecastles, cabins, etc., if needed; inspect the linen lockers, dish lockers, galleys, water closets, mattresses and bedding; note whether there are free channels for the escape of the water in the bilges, as otherwise it will stand, and, getting mixed with the cargo, will become foul; advise that the bilges be painted with

milk of lime at intervals, or else washed out with permanganate solution, note the interior of the water tanks as to whether they are smoothly cemented or not; also the accessibility of the tanks, as to whether they are ordinarily buried under the cargo, or whether they can be gotten at easily in case of necessity.

Experience has shown that a thorough fumigation of vessels twice a year will keep rats and vermin down to a minimum. Vessels that had at the first fumigation anywhere from 200 to 400 rats and a corresponding number of cockroaches, after three or sometimes less fumigations, would have 10 or 12 rats only, and the cockroaches were correspondingly decreased. These measures are of value, not only as a sanitary measure, but one of distinct advantage to the owners of the ship as they largely destroy the ants, borers and other insects that destroy the woodwork of the vessel, and materially add to her durability.

Some objections have been made on account of the odor left after sulfur fumigation. This can be removed from the woodwork by thorough ventilation and washing with a weak solution of caustic soda; from bedding and mattresses by shaking, airing and sunning for six or eight hours.

The value of this measure has been fully demonstrated by the freedom from disease that vessels have had, by the increased comfort of the traveling public, and by the fact that owners, agents, and masters frequently request voluntarily that their vessels be treated, stating that rats, cockroaches, etc., are beginning to come back and they would like to have them destroyed.

Among the general considerations to be noted, it will be found that one of the most important is in regard to the isolation of passengers. When these persons are taken on shore to be detained during the incubation period of the disease, they should be separated into groups as small as possible, and strict separation maintained. This will minimize the danger of repeated infections as a result of the occurrence of new cases, and in addition, those groups that have no disease occurring among them may be released much sooner than they otherwise could be.

The passengers should never be detained during the incubation period on shipboard, but every effort should be made to get them on shore. I could give a number of instances, were space available, to support this statement.

As to the different agents to be used in fumigation, sulfur is the most satisfactory, and should be used by burning in pots, or by some form of furnace by which the oxygen is extracted from the air simultaneously with the introduction of the sulfur, thus adding the element of asphyxiation toward the destruction of the vermin. When pots are used, they should be placed in pans of water for reasons of safety, and to increase the efficiency of the sulfur dioxid.

Hydrocyanic acid has been recommended as an agent for fumigation, but the extreme danger attendant upon its use forbids it. Carbon dioxide has also been recommended, being generated from burning charcoal. The disadvantage of this is the difficulty of getting rid of it, it being much heavier than air. It is dangerous to go into the holds for some time after its use, and some English investigators have stated that in generating CO₂ from charcoal CO is also formed, and that if this is present in greater quantity than 13 %, an explosive mixture results. Mercuric chlorid solution 1 to 1,000 is the best liquid disinfectant to employ, as it leaves no unpleasant odor, but on the contrary is a distinct and decided deodorant. It dissolves readily in sea-water, and is not nearly so destructive to paint as are some other agents. Its use should always be preceded by a mechanical cleansing of the surfaces to be disinfected.

For personal effects, as clothing, etc., steam under pressure is the best, formaldehyd gas being used for articles likely to be injured by steam. For water tanks, potassium permanganate, or boiling the water in the tanks by conducting a steampipe from the boiler directly into the tanks. For the disinfection of water closets, urinals, etc., carbolic acid in 5 % solution, following such mechanical cleaning as may be practicable. For the bathing of the persons on board, a fresh water shower bath with plenty of water and some alkaline soap that will dissolve grease, dirt, and collections of epithelium.

In conclusion, I would state, that this cannot be considered as a scientific paper, discussing the relative values of the different measures used, but rather as a statement of the results of years of practical experience gained by officers of the Public Health and Marine-Hospital Service, and the result of the experience and knowledge derived from the cholera epidemic of several years ago, and from other diseases handled during and since that time.

Cleaner Trolley Cars in Camden, N. J.—The first step toward cleaner trolley cars in Camden was taken when the Board of Health appointed Medical Inspector Leavitt, Nuisance Inspector Starr, and Dr. H. H. Davis a committee to wait on the Public Service Corporation and urge immediate action.

The Medical Profession in Austria.—The most recent official statistics show that at the beginning of the present year the total number of medical practitioners in Austria, not including Hungary, was 11,764, being just one less than in 1904. Of the whole number, 3,572 practise in Lower and 403 in Upper Austria, 138 in the province of Salzburg, 702 in Styria, 150 in Carinthia, 109 in Carniola, 369 in the Coast Province, 612 in Tyrol and Vorarlberg, 2,744 in Bohemia, 944 in Moravia, 246 in Silesia, 1,491 in Galicia, 154 in Bukowina, 142 in Dalmatia, 117 in Bosnia and Herzegovina. The numbers in the large towns are as follows: Vienna, 2,813; Linz, 69; Salzburg, 47; Graz, 275; Klagenfurth, 39; Laibach, 44; Trieste, 190; Innsbruck, 99; Prague, 367; Brun, 168; Troppau, 46; Lemberg, 346; Czernowitz, 67; Zara, 22.

DIGEST OF MEDICAL LITERATURE

ORTHOPEDIC SURGERY.

H. AUGUSTUS WILSON

J. TORRANCE RUGH

THE OPEN-AIR TREATMENT OF ALL FORMS OF BONE AND JOINT TUBERCULOSIS.

BY

J. TORRANCE RUGH, M.D.,

of Philadelphia.

For many years the beneficent influence and positive curative effect of the free and unadulterated atmosphere (not the climate) upon pulmonary tuberculosis has been widely recognized by both the laity and the medical profession, and in the event of the development of this disease in an individual, the first thought occurring to the mind of the physician has been the accomplishment of the out-door treatment of the case under favorable atmospheric environments. These conditions, experience has shown, are most commonly found in elevated places which also offer a minimum of moisture and a maximum of sunshine. It has also been ascertained that to prove efficacious the entire 24 hours of each day must be spent in the open air, protection only being permitted against storms and dangers of severe cold or heat. Recently there has appeared a more or less extensive agitation among surgeons, and especially orthopedic surgeons, for the employment of the open-air treatment in all forms of bone and joint tuberculosis, the reasoning being that as fresh air has manifested such marked influence upon the pulmonary form in which local treatment is of no avail, it should prove more effective in those forms in which local measures have proved of such paramount importance and can be so readily and advantageously applied.

As is the case with each newly adopted measure, enthusiasm marks the reports of the writers over the results which have been obtained, and the cases detailed certainly indicate the profound influences which pure air exerts upon this very troublesome and very common condition. Contrary to the experience with the pulmonary forms, however, elevation does not play an important part in this variety, as the reports from the seashore sanatoriums are in every respect as favorable as those in the mountains, and others in the country or rural districts have proved equally successful.

E. H. Bradford, of Boston (Boston Med. and Surg. Jour., Vol. cliv, No. 3, pp. 57-60), reviews the work done in Boston and vicinity for the past 35 years and directs especial attention to the Wellesley Convalescent Home, an adjunct to the Children's Hospital of Boston. The work of this institution was planned and directed by Dr. H. L. Burrell, who realized that "the prime essentials for the treatment of tuberculosis are physiologic rest, out-door treatment, and ample nutrition to the patient" (Comm. Mass. Med. Soc., Vol. xix, No. 11, p. 303). Most gratifying results have followed the efforts in that institution, as shown in "a marked increase in weight and in hemoglobin" after the patients were transferred from the wards of the hospital. Some of the patients gained more and some gained less, but the average gain

of a nonselected number of patients was a pound a week. The distinguishing fact in this report is that these cases were taken from a well-appointed hospital where those forms of treatment are in use which have been proved by careful observers and scientific surgeons to be the most serviceable and most effective, and were placed in the open air, and yet they registered marked gains and improvement in almost every instance. Bradford also directs attention to the fact that "experience amply demonstrates the curability of bone and joint tuberculosis . . . and that in a large number of cases at a certain stage, when every other method has been attempted, this treatment (fresh country air) may give the stimulus that is most beneficial." To substantiate the fact "that bone and joint tuberculosis is capable of a definite cure, permanent after the bone has cicatrized," he details 31 cases treated at their homes in Boston by well-recognized means in use among orthopedic surgeons at the present day. These cases show what can be accomplished in many instances without the adoption of the rigorous, and at times rather strenuous, system in use in the special sanatoriums. When it is recalled that the average period of time for the recovery under careful and thorough mechanical and hygienic treatment is from two to five years, and that the final results depend upon the early recognition of the condition and the prompt adoption of proper measures to combat it as well as the assiduous attention to the case until cured, the true status of the treatment of this disease becomes patent, viz., that each case must be treated on its own merits and that the majority will recover under those methods of treatment in common use, but that certain ones will also require in addition the rigid application of the open-air treatment.

John D. Adams (*Ibid.*, pp. 71-73) gives a more detailed report of cases treated at the Convalescent Home referred to by Bradford, and after pointing out the beneficial results as indicated before, concludes that fresh air is essential in the treatment of bone and joint tuberculosis; that sunlight is an aid, but not an essential; that ambulatory cases do better than bed cases; and "that this treatment is only for convalescent cases and not those in the acute stage as shown by the lack of improvement in the more acute cases." This is bringing the treatment down to a rational basis which shows more or less accurately the indications and contraindications for its employment. It is to be regretted, however, that his experience does not prove favorable to those cases which are acute, since here so much of the future for the patient depends upon the rapid checking of the inflammatory process and the subsequent ravages of the disease. Natural inference would anticipate beneficial results even more marked in this class of cases.

H. A. Wilson, in a recent article (*Penna. Med. Jour.*, Jan., 1906, p. 260, *et seq.*), reviews the pathologic features of this disease together with the results of properly and improperly applied treatment as well as of the untreated cases. The influence which the mental attitude of the patient exerts upon the disease is very profound and as the tendency in these cases is to depression on account of the chronicity of the condition the change of scene to mountain or shore is of the greatest value, and his observations are entirely in accord with those of Galloway, of

Toronto, who finds "the patients almost immediately begin to put on flesh" (from the improvement in appetite), "while mental depression vanishes and a buoyant, happy, hopeful feeling takes its place." Wilson ardently advocates the benefits of the sea-air of Atlantic City, as his opportunities for observation of cases there have been more abundant than elsewhere. In many advanced cases the changes for the better have been rapid and sure. The secret of the improvement here, as elsewhere, lies in the judicious combination of fixation or protection to the affected part, fresh air both day and night and nourishing food, of which eggs, milk, and cream form the basis.

The Children's Sea Shore House has been instrumental in advancing our knowledge of the value of the salt air in these conditions, as the almost continuous experience is that the symptoms of the disease are checked and in many instances entirely dispelled by a stay in that institution. The effects of the winter air have not been ascertained by this institution, as it is closed during that period of the year, but there have been many extramural observations made and they are almost uniformly good. Operative procedures are frequently unnecessary and when they have been employed with unsatisfactory results these have changed by a stay at the shore. There should be no relaxation of vigilance in the mechanical treatment of the cases or neglect to employ other well-recognized forms of treatment in addition to the out-door life of the patient. Freedom should be permitted to all unaffected parts and activity encouraged so long as it does not interfere with the diseased area.

Another feature of this form of treatment is brought out by W. S. Halsted (*American Medicine*, Vol. x, No. 23, pp. 937-946) in a detailed report of 11 cases treated by the out-door method. Halsted is an enthusiastic advocate of the Adirondacks and the chief indications for treatment in such a place are failure to improve under home treatment, advantages of the routine and regime in a sanatorium (such as is conducted by Trudeau at Saranac Lake), and the great benefits of a speedy recovery in a young and rapidly growing individual. He believes "the importance of rapid cures has not been emphasized, nor has the possibility of such marvelously prompt results as the continuous out-of-door treatment furnishes been recognized."

A critical examination of the cases cited will show that it has required about the usual length of time (2 to 5 years) to secure the final results even in such an atmosphere as the Adirondacks offer, though some of the cases failed to recover in their home surroundings in spite of every care, hence were proper subjects for the employment of the rigid routine of the sanatorium with out-of-door life all the year round.

In the treatment of pneumonia, typhoid fever, and other conditions for which we have and know no specific, conservatism enjoys the greatest confidence and is most extensively employed. In like manner, in the treatment of bone tuberculosis out-of-door life is recognized as a most potent ally in all cases and as a necessary one in some cases. Some of these cases will derive more benefit at the seashore, while others will go rapidly

down if placed elsewhere than in the mountains. The bleak shores of New England offer less benefit than those further south, while the Adirondacks and the Carolina mountains seem to offer better facilities and prospects to the majority of those who must seek them. Each case must determine its own atmosphere and remain in it, using at the same time all care in the local treatment of the disease. The manner of housing patients while administering the treatment is as yet somewhat in doubt, but it will probably be found that tents will prove more satisfactory in those places where the variations of temperature are not so great, while more permanent and substantial structures will be required where patients are likely to suffer from the effects of cold. In the Wellesley Home, stoves are used to prevent the temperature from falling below 20° F.

In whatsoever surroundings, however, the patient should be given all the fresh air, both day and night, that the locality or environments will afford, and the development of the patient's resistance should be assisted in every way possible and the results will be gratifying not only to the physician, but as well to the patient and friends. When these measures are thoroughly carried out the ravages of this foe of humanity will be much less manifest and it may ultimately be stamped out.

SCOLIOSIS.

BY

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of Philadelphia.

It is not at all remarkable that scoliosis has received the attention that has been given to it, because when once the condition has become established, absolute correction can rarely, if ever, be accomplished. The changes that occur in the bones composing the spinal column render it impossible to ultimately obtain normal function, although the amount of improvement that can be obtained often gives rise to the hope that the conditions may be still further bettered. In recognition of the great difficulties that are to be met with in correcting scoliosis, orthopedic surgeons have devoted much time and thought to the prevention of the occurrence, and in this field untold good has undoubtedly been accomplished. Not alone have orthopedic surgeons given the subject of prevention of scoliosis attention, but their work has been supplemented by others more or less interested in the subject. Gould (*American Medicine*, April 8, 1905) has clearly established the fact that it is demonstrable that the great majority of the so-called cases of idiopathic spinal curvatures are directly and indirectly the consequence of visual function, and chiefly of binocularity, dextrocularity, and astigmatism. The school desks and seats, imperfect and unhygienic as they are, are not the primary or chief factors in the production of morbid writing postures, and hence do not, *per se*, cause spinal curvatures. They are not the cause of slant writing, nor has slant writing any relation, as a cause, to disease or malposition, but is solely a result of malposture. "There is, therefore, thus produced a three-fold increase of the scoliosis producing agency, which is transmitted to the dorsal and lumbar portions of the

spine in the effort at compensation." Gould's discovery that there was a resultant spinal curvature in most of the cases of head tilts that were found to be associated with astigmatism, particularly of the dominant eye, has important bearings that demand critical examinations of the eyes in all scoliotics.

R. Liebreich (*Klin. Monatsblätter für Augenheilk.*, Vol. xlii) favors the use of vertical writing. He believes that the chief harmful element in school life is the rotation of the vertebral column upon its long axis when the book or writing is held too close to the eyes and the body flexed forward to accomplish this.

J. Madison Taylor (*Monthly Cyclopaedia of Practical Medicine*) has observed that after prolonged pulmonary disturbances there is a marked derangement in the alignment of the upper dorsal vertebra, and that in the cases of protracted disorder of the digestive organs there are noted similar disorganizations of the lower dorsal and upper lumbar vertebrae. These cause the spinous processes to be at varying distances apart, or more prominent or out of the vertical line, results due to loss of tone and relaxation in the supporting ligaments. The hypothesis is broached that if these conditions persist, permanent lesions and deformities may result. He advocates prophylaxis in correcting the visceral disorder as well as in manipulating the spine.

H. Spitzzy (*Zeit. für Orth. Chir.*, Bd. xiv, Heft 3, 4) gives a very complete review of the literature on the causes of bone changes in rickets. His views coincide with those of Hoffa that there are few cases of typical rickets in which the spine does not show bony changes. Hysterical scoliosis: O. Hovorka (*Zeit. für Orth. Chir.*, Bd. xiv, Heft 3, 4) and D. Zesas (*Arch. Internationales de Chir.*, Vol. ii, No. 1) cite cases of scoliosis that developed very rapidly, presented no anatomical changes, and patients manifested other signs of hysteria. While no anatomical changes are present in hysteria, long continuance will inevitably induce bony and other changes. They express the opinion that is generally accepted that these cases do not usually terminate favorably.

A. Codivilla (*III Congresso Dell'Assoc. Naz. dei Medici, Bologna, 1905*) on "The Importance of Scoliosis to the Practical Physician" calls attention to the fact that physicians fail to recognize scoliosis in its early stages when it is most amenable to treatment, and also that it not only deforms the body, but exerts its pernicious action on the thorax and abdominal viscera. His valuable paper dwells at considerable length upon the visceral derangements and distortions that occur in more or less severe types of scoliosis, and presents an unusually strong argument in favor of early recognition, so that there may be early correction of the spinal deformity before serious bony changes occur. He gives strong emphasis to the fact that "with the exception of the absolutely initial forms, I have never seen a scoliosis completely cured; there always remained signs of the primitive deviation." A. E. Stein (*Zeit. für Orth. Chir.*, Band xiv, Heft 3, 4) describes "The Technic of Scoliosis Measurements," a method similar to that described by Hovorka, through a netted screen. He also places the camera in a standard position, after the principle similarly described by Spellissy.

Henry O. Feiss (Boston Med. and Surg. Jour., July 13, 1905) describes "The Recording of Rotary Deformity by Projecting Horizontal Points" by a simple apparatus devised by him and Fayerweather. The apparatus consists of a simple upright with adjustable horizontal arms, which enables the observer to record tracings of the trunk in a horizontal plane at any level, and with accurate relation to a perpendicular plane passing through the two horizontal ones. Mechanical correction of scoliosis is given considerable attention, notably by four papers by L. Heusner (Zeit. für Orth. Chir., Band xiv, Heft 3, 4), K. Gerson, H. Legal, and A. Kaisen in the same journal.

Rudolf Klapp (Münchener med. Woch., Nov. 28, 1905) contributes a very valuable paper on "The Mobilization of the Skoliotic Spine by an Active Method," believing that it is necessary at the outset of treatment in all instances in children. This combats the contracture of the vertebral ligaments and of the muscles of the back situated on the concave side of the deformity, and thus diminishes or even removes limitation of movements produced thereby. To achieve this purpose a number of passive methods have been devised and are being practised, while active mobilization is being entirely disregarded, although the value of the former in comparison to the latter has been found very limited. Klapp states that he has noticed "that four-footed animals, when walking quietly, bend their spinal columns to one or other side at each step. It is seen best in young dogs, but also in horses and cows; at each step made by the hind leg the vertebral column bends to the other side. Man, crawling along on all fours, that is, on both hands and knees, will have the same walk, but he must not move the limbs of one side together, but rather have them approaching on one side, while far apart on the other. The spinal column will make easily observed and extensive lateral excursions with each step. The lateral bending can be increased by strongly turning the head toward the concave side; this twisting should be just about sufficient so that the teacher standing about five feet behind the patient can still be seen by the patient as he turns his head to either side. The reason so much more can be accomplished with the crawling than in the upright posture is that the patient is bending the spinal column from both ends, head and pelvis." Within a short time children that have been thus treated in Klapp's clinic at Bonn have developed immense muscles of the back and became regular back athletes. This wonderfully instructive paper gives details of the manner of protecting the hands and knees of the little patients, the length of time that they crawl each day, and the instruction that is necessary in order to have them learn the precise methods necessary to accomplish the correct movements adapted to each case. Some of the patients are taught to walk (crawl) in a circle toward the side on which the primary convexity exists, thus bending more to the convex than to the concave side. It is not surprising to note that as the observations of Klapp are based upon cases in the clinic of Bier that the employment of hot air is advocated. Klapp urges that before each treatment hot-air application should be made for 20 minutes instead of massage. He believes that the heat

reacts very favorably toward mobilization. The hot-air chamber at Bonn is arranged for five children at a time, but any sized chamber can be made. B. E. McKensie (The Canada Lancet, Feb., 1906) strikes the keynote in his paper on the "Treatment of Roto-Lateral Curvature of the Spine" when he says: "By developmental methods is meant such means as will tend to increase muscle, size, tone, power, general health, growth, self-reliance, will-power, and increased activity; by restrictive methods such means as will aim at erectness of the body, though it be at the expense of growth and development." McKensie urges the absolute necessity of obtaining the cordial cooperation of the patient in order to reach the ideal result. The summary formulated by McKensie is very emphatic: "1. Absolutely essential that a correct diagnosis be made determining that the deformity present is not due to and symptomatic of organic disease. 2. Developmental methods of treatment much better than restrictive. 3. This treatment ranges itself under (a) the employment of force; (b) education. 4. Under such treatment not only is the deformity made better, but important indirect gains follow."

The *American Journal of Orthopedic Surgery* for January, 1906, presents a valuable array of practical papers of deep interest to general medical readers as well as to those especially interested in orthopedic surgery. The 23 pages devoted to abstracts of orthopedic literature of the world bring the recent papers that have appeared in all languages before the reader in a condensed form that enables one to know just what is being done elsewhere. E. H. Bradford's paper on "The Use of Traction in Hip Disease" states: "1. The fact that the hip-joint is surrounded by strong muscles which, when in a state of contraction or spasm, affect not only the position of the limb and cause deformity, but also increase the pressure of the head of the femur upon the acetabulum. 2. The difficulty of fixation of the hip-joint, owing to the mobility of the pelvis and spinal column. 3. The importance of the hip-joint in locomotion. 4. Pathologic conditions peculiar to the hip-joint." Under these four headings the paper presents a strong argument in favor of traction efficiently applied and maintained sufficiently long to accomplish the desired object. The paper is based upon observations of the conditions and results obtained by the use of traction and the records of 3,400 cases of hip disease during the last 30 years at the Boston Children's Hospital. It is impossible to abstract such a paper as Bradford's without marring it, for it is full of profound thought. Every word on the 13 pages is needed in the elaborate presentation of the subject, and the master hand is manifest throughout. Such careful observations and deductions as those of Bradford's above referred to must have made a strong and favorable impression when the subject was presented at the First International Congress of Surgery, Brussels, September, 1905. The paper must be read with care to be appreciated.

H. A. Wilson presents "An Analysis of 152 Cases of Hallux Valgus in 77 Patients, with a Report Upon an Operation for Its Relief," and gives a number of illustrations showing the deformity before operation, with

several after lateral excision of the distal extremity of the metatarsal bone of the big toe. An experience in 58 cases operated upon in the manner described seems to warrant the author in advocating this form of correction in all cases where bone operations are indicated, but stress is laid upon the desirability of carefully selecting cases appropriate for bone operation. P. E. Peckham, describes "A Portable Frame for Holding a Patient with a Fracture of the Shaft of the Femur while Plaster of Paris is Applied." The frame is an ordinary gas-pipe frame, which may be laid across two tables of stands in any house. Extension is suitably applied to both legs. The patient can be etherized while on the frame and sufficiently strong extension made upon the legs to secure proper position of the fractured bone when the plaster of paris is applied. G. G. Davis contributes a very learned research with report of two cases of "Multiple Cancellous Exostosis." The literary digest of the subject is concisely handled and gives the views of those who have given the subject especial attention. Davis' summary is a careful presentation of the condensed facts and is therefore here given: "1. The frequency of the affection justifies its more general recognition in surgical literature. 2. Its characteristics entitle it to be considered as a separate and distinct disease. 3. That multiple cancellous exostoses would be a suitable name for the affection. 4. That the growths are cancellous in nature. 5. That they may possibly date from birth but are recognized in a variable time after birth. In my first case the disease showed itself at the age of ten years, in the second at the age of one year. 6. That rickets is often concomitant of the disease rather than its cause. 7. That while the growths are most common in the neighborhood of the epiphyses they do occur sometimes as far as even midway between them. 8. That sometimes the growths cease appearing at a certain age, in others they keep on appearing indefinitely. 9. That the growths sometimes disappear. 10. Injury plays no part in their causation. 11. That the bones are most often affected in the following order: ulna, fibula, femur, tibia, humerus, and phalanges. 12. That owing to interference with epiphyseal growth marked deformities are produced. 13. That in many cases heredity seems to play a conspicuous part. 14. That there is no definite relation between the length of the bones to the amount and size of the exostoses."

E. W. Ryerson reports an unusual case of "Sacroiliac Disease in a Child, with Operation."

W. E. Blodgett presents "Congenital Luxation of the Head of the Radius. Report of Two Cases. Analysis of Fifty-one Cases. Summary. Certain Other Considerations. Conclusions."

This paper is clearly illustrated by four radiographs. The tables giving the essential facts of the fifty-one cases and the forty-two references to literature on the subject makes an extremely valuable contribution of observation and research.

H. O. Feiss' paper on "Spontaneous Fractures with Rickets. Report of a Case," is carefully recorded as to clinical observations, photographs and radiographs; the bibliography adds completeness to the article. An ob-

servation of Feiss is worthy of note: "The chief lesson which we can draw from the above is that the röntgen rays ought to be used on every severe cases of rickets. How many undiscovered fractures must have occurred before the days of the röntgen rays can scarcely be imagined, and even at the present day these unseen fractures must occur far oftener than is usually surmised."

REVIEW OF LITERATURE.

Fracture of the Neck of the Femur in a Child.—Lammers (Berliner klin. Wochenschr., 1904, No. 32) holds Hoffa responsible for the statement that the condition in question has occurred in but four other cases; Lammers' case is the fifth. As etiologic factors, falls upon the hip play the most important role; these, however, are not always severe. While Hoffa maintains that in one group of these cases the fracture arises as result of tuberculosis of the femur, Lammers argues that the reverse may be true. The child, he says, falls, breaks the neck of the femur without the onset of symptoms, but the tuberculous condition develops gradually, finally symptoms arise, and then the fracture is detected. In Lammers' case no data could be obtained as to when the fracture occurred. He explains these obscure conditions in this way: these patients sustain fractures which become impacted so that walking is not interfered with, or the untorn periosteum maintains the continuity of the neck, but so soon as solution of the impaction or stretching of the periosteum occurs, the fracture is detected. The fracture referred to by Lammers occurred in a boy 4½ years old who had been lame for a year, and in whom he found the leg shortened 1 cm., abducted and rotated outward; the head of the femur was in its normal position, but the trochanter was above Nelaton's line. The musculature of the leg was wasted. With reference to treatment, Lammers says when a fracture is seen immediately, the leg must be placed in extension or placed in plaster of paris, and when it is removed from the plaster, or after extension is removed, the child must wear a support for at least one year. [J.F.]

Treatment of Flatfoot.—A. Sachs (Therapie der Gegenwart, 1904, xlv, 416) treats flatfoot by strengthening the ligaments and muscles of the foot and by ordering a suitable shoe. The former he achieves by endorsing the gymnastic exercises of Ellis and Roth. They consist of the following: 1. The patient lying on his back with the foot somewhat overextended is made to perform strong adduction and supination movements. 2. The same movements with an assistant resisting them. 3. The assistant forcibly abducts and pronates the foot, held firmly in adduction and supination. 4. The foot is made to perform rotatory movements around a point situated to the inner side of the great toe. The leg is held as quietly as possible. 5. The patient stands with his toes together and his heels apart, the feet thus forming an angle open toward the back; in this position he must elevate and lower himself on his heels for some moments. 6. The same exercise is associated with a bending of the knees, thus developing still more power in the afflicted muscles. He has his patients go through these exercises three times daily; each time it takes probably 15 minutes, as the movements must be performed from 15 to 20 times. The shoe employed by him is laced; its inner border is elevated 5 mm. above the outer; its arch is supported by making this portion extra stiff and by bringing the heel more forward and longer on the inner side than the outer. The leather is not shaped on the inner side to run outward into a point, but is made into a straight line or even shaped to go further inward. In such a shoe as that the patients soon lose all their pain, and as the muscular and ligamentous structures are strengthened, the flatfoot patient is freed of his symptoms. [E.L.]

American Medicine

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The American breed is the term used by Professor Edward A. Ross, of the University of Nebraska, to describe what he believes to be a distinct variety of man—the restless, strenuous people so different from the easy-going types of Europe. There are many reasons why our immigrants should become so nervous and energetic in one or two generations, but Ross seems to think that the restlessness is not acquired here, but is the reason why these types left Europe. America is therefore weeding out the energetic folks from Europe—they are selected venturesome natures and constitute a type. Our self-pride always leads us to assert that we are descendants of the pick of Europe—the best people; but there is another and darker side to the matter which we must keep in mind to cultivate a proper humility.

The successful people of a country are those who stay at home, and it is only the unsuccessful or comparative failures who are discontented and migrate to better their fortunes. Instead of receiving the best we get the worst, and perhaps—and here's the rub—we always have received the worst. A small minority may indicate abnormality of some kind—they differ in opinion from the great mass of the normal or average. Hence, those who came for the purpose of practicing peculiar religious views may have been far from normal. The very boastfulness of the American eagle is itself an evidence of mental exaltation. So let us be humble and remember that for murders, crimes, civic unvirtue, and various other trifles we lead the civilized world. We hold life cheaper than the Chinese, we glorify certain murderers and hang very few, and our methods of high finance should please the devil himself. Have we acquired all this wickedness or are we naturally wicked—selected types?

A legal definition of the practice of medicine has been made by Judge Joseph I. Green, of the New York City Court, as a result of his failure to find one on

record in any State court. It is reported that the matter has given intense satisfaction to the County Medical Society in its fight against the quacks—indeed the definition is the outcome of one suit it had instituted. "The practice of medicine is the exercise or performance of any act, by or through the use of any thing or matter, or by things done, given, or applied, whether with or without the use of drugs or medicine, and whether with or without fee therefor, by a person holding himself or herself out as able to cure disease, with a view to relieve, heal, or cure, and having for its object the prevention, healing, remedying, cure, or alleviation of disease." If this definition be accepted in other States, it will help to simplify the crusade against ignorant pretenders who have hitherto escaped punishment on technicalities. It will be noted that it implies that friendly advice is not practising medicine. It has been gravely stated in the past that if doctors had their way, no one would be safe in telling his neighbors to take a little whisky for his cough, or cold, or fever, or any of the other thousand things for which a certain class of laymen recommended it. Under this decision Christian scientists are practising medicine illegally and liable to prosecution, and so are osteopaths and all other unlicensed claimants of curative powers. If followed up, it is apt to create a great commotion among the poor neurotics who keep the fads alive.

The Chicago drainage canal decision of the United States Supreme Court has received but little comment so far, though it appears to be one which makes an epoch in our sanitary history. It will be recalled that the city of St. Louis objected to the Chicago system of pouring sewage into her water-supply—the Mississippi river. Suit was brought to compel Chicago to adopt some other system of sewage disposal. Scientific examinations were made by experts on both sides, and the voluminous testimony is said to have made the largest record of any case ever decided by the Supreme

Court. So far as published, the court is reported to have decided that St. Louis has not proved her case, and that there is no evidence that any of the sewage or its bacterial contents ever reach that city, and that it is, therefore, not shown that her water is in any way injured.

The Dangers of Using Streams for Sewers.—It is difficult to imagine what would have been decided had it been possible to prove that the sewage did pollute the river. It seems to be accepted that the organic materials are destroyed by water saprophytic bacteria and that the pathogenic organisms perish. This may be a true statement of what occurs in this case, as it is what eventually occurs in every case in time, but in one sense of the word it is unfortunate even if true. It places a certain stamp of approval upon the American plan of using the streams as sewers instead of water-supplies. It is the same as though everyone cleaned his back-yard by throwing his refuse over the fence, to rot away in his neighbor's yard. The burden of proof is upon the people down stream, and unless they can show that their water is injured, the system can go on forever. There might sometime arise a case in which this can be proved, and the sewage will then be disposed of in some other way; but until that case is decided, every community apparently has the right to use the rivers for sewage disposal, whether those down stream like it or not. In our sovereign American fashion we do not care whether or not we injure our neighbors—every city must look out for itself and take what other cities give it.

A belated football echo comes from Berlin in the form of a press dispatch quoting some remarks made by Professor William Ostwald, of the University of Leipzig. He had recently returned from delivering a course of lectures at Harvard and had given his impressions of student life in America. His views are interesting, as they let us know how others see us, particularly as he seems to have gained a distinct impression that our college sports detract from education instead of enhancing it.

"The personal interest of the students next to their studies is concentrated alone on sport, which draws their attention altogether from intellectual or esthetic pursuits. Football before all is loved uncommonly, and it is practised in such a fashion that academic and State authority are near to forbidding it altogether. In the course of a single semester nineteen students fell victims to enraged, brutal handling. At every American university is a sort of open amphitheater in which many thousands of spectators view the periodic football battles."

It sounds like the cheap literature describing a visit to Mars, or a Martian's visit to the earth; but apart from this humorous side to the matter, it is important enough to receive attention from American educators.

Poverty and pauperism have been studied by a host of sociologists and there is an immense literature upon the subject. The most recent book, and in many respects the most noteworthy, is the one written by Robert Hunter, who for many years has been a practical worker among the submerged tenth. He defines poverty as the condition in which it is not possible to obtain those necessities which will permit the maintenance of a state of physical efficiency. He also makes the astounding statement that there are ten million people in poverty in the United States alone—one in every eight. Charles Booth calculates that 30% of London's population, or 1,300,000 people, are in poverty, and that the rate in smaller towns is nearly the same ("Life and Labor in London"), so that the phenomenon is apparently universal, the lower the civilization the greater the percentage of the poor. For many reasons the whole matter is of vital interest to the medical profession. In the first place, such a condition of affairs is a serious objection to the new idea that our national dietary is too big—one-eighth of us never get enough. The racial deterioration and individual degeneration which must result in such condition of growth of children is a matter for serious thought. In the next place, when any of these poor people become ill, the burden of work falls on the doctor, who, more than any other person in the world, is expected to give assistance without money and without price. Hunter makes a great distinction between these poor and the paupers, who expect and depend upon more or less assistance, even when they are well. He estimates that there are four million paupers in the country, two million men are unemployed four to six months every year and cannot get work, over 1,700,000 children must work to help support the family, and about five million women must work, of whom 2,000,000 are employed in factories. Over one-fourth of New York's people get some kind of public or private relief every year, and yet it is often impossible to get house servants for love or money.

The insane and blind are the two classes which have received our greatest sympathy to our mutual injury. One of the best signs of a reaction is the increasing number of cases in which the courts are compelling men to support insane relatives confined in public institutions. The old idea that this was a legitimate burden for society seems to be definitely given up. Of course, society is protecting itself, in a sense, and must pay for it, yet it has a perfect right to compel the family to confine its insane to prevent public injury. Men have too long been forcing their burdens on society and thus becoming semipaupers themselves. There is an increasing body of opinion that we have overdone the charity to the

blind and have positively pauperized them. It is said that many of the inmates of these institutions are not really blind at all, and that the truly blind are in many instances fully able to support themselves in comfort if they were only compelled. They are forced into parasitism by a diseased form of excessive charity. Indeed, there is need of an overhauling of all our charitable institutions with the sole view of preventing wholesale pauperism. It seems brutal to say so, but it does seem that it would be better to let a few suffer rather than ruin the many by too much help; but, of course, it is repugnant to our sense of humanity to allow any relievable suffering to exist.

The blind masseurs of Japan impress the visitors to the Orient more powerfully than any other matter. For many centuries the blind, by law and public opinion, have had a monopoly of this profession. It is even claimed that children have been partly blinded to enable them to take up this calling. In most of the cases there is not complete blindness, but merely the defect of vision, due to corneal opacities. Some of them, indeed, see quite well, and it is not at all unlikely that their sight has been purposely injured. They walk the streets at night, blowing a curious flute or horn, having a few mournful notes which sound like the wail of a lost spirit. The hotels have their special operators for guests, but the native who wants massage waits until he hears the whistle, and then calls in the stroller as he would a peddler. They are very crude in their theories and are said to do harm occasionally, if not often, but it is such a universal custom that it must be beneficial. They are the original osteopaths, another instance of our backwardness in comparison to the Orient. The Japanese hospitals utilize massage to a much greater extent than we do, and it would be wise to imitate them. It has been suggested that it would also be a profitable employment for our blind, and the suggestion is worthy of consideration. The delicacy of touch which naturally comes to them would be of immense advantage; indeed this may be the reason why they originally monopolized the calling in Japan. Under the direction of the physicians in attendance, there is no reason why many of the blind should not make very good pay as masseurs—relieve society of the burden of supporting them, prevent the dreadful parasitism into which they are too apt to sink, and check osteopathy.

The care of the unemployable in Denmark is described by the Rev. Wilson Carlisle ("The Nineteenth Century and After") and the matter is of considerable medical interest, in that it is recognized that these people are really suffering from physical and nervous disabilities.

In Great Britain and America, and indeed in most of the civilized world, they are considered to be normal men of vicious habits to be punished for their acts and abandoned to their fate. They become tramps or they roam the streets, picking up odd pennies for odd jobs; or resort to crime to get food for which they cannot work. It is a diseased condition of nervous poverty, often physical poverty, too. Sometimes, if not generally, it is congenital; they are the offspring of parents unfit for parenthood by reason of accident or disease, but generally they sink into bad habits which accentuate the condition and it then appears to be wholly acquired. They are invalids and it is absurd to arrest them, put them to hard labor, which only increases their exhaustion, and then turn them loose even less able to struggle for existence. In Denmark their treatment is highly satisfactory, because it happens to be based on scientific principles. They are gathered into colonies and given such work as they are able to do (gardening, farming, the trades and the like), awarded wages in proportion to their labor, and released when cured. Even the lowest and least fit classes are thus treated; they all do what they can and none are supported in a homicidal idleness, as in our almshouses, unless they are absolutely helpless. The incurable are never released, so that the country is comparatively free of beggars and tramps and society is saved from the crimes which are the feature of our system. They are even helping society care for them. It sounds like the millennium, for they have no processions of the unemployable unemployed crying for work which they never will do. The people of London are almost paralyzed by their increasing burden of pauperism—a burden admittedly caused by their poor laws—28 paupers in every 1,000 of population! In addition to these registered paupers there are the hordes which get some relief, and the remedy only increases the disease. The rottenness is not in Denmark this time.

Putrid meats in sausage is the latest sensation from Berlin, and the details as reported in the press dispatches are so atrocious that our own scoundrels in this particular line should feel positively virtuous, if not angelic. The provision dealers have been under investigation, and one, whose chief business was making sausages for sale to the army and for export to other towns, was shown to have used horseflesh and putrid pork as the chief ingredients of prime beef sausages. Not only this, but he used fats of all sorts and of all conditions of freshness, refuse meat scraps of all kinds, rancid butter, margarin, and other obnoxious things—all thrown pell-mell into the cauldrons which would collect 6 in. of sediment, "mostly sand and filth." Coming from a nation which has the most to say against the unwhole-

some methods of American dealers, it is certainly a revelation. A good housekeeper never buys food she cannot inspect. All mixtures, such as mincemeats and sausages, were originally made at home to utilize parts of an animal which would otherwise be wasted. They were household inventions for economy, but have become articles of commerce which cannot be inspected to determine their contents. If we are to continue the use of these articles—and it is quite likely they will always be demanded—is it not time to put all such manufactures under rigid government control? The public health demands some relief from the digestive disturbances which can be ascribed to improper mixtures of this sort. It is a very old story. It is now said that when the last survivors of the Sir John Franklin arctic expedition reached their cairn they found that their pemmican had been packed putrid, so that they perished through the criminal misconduct of a butcher in England. Every item of this sort should strengthen the hands of those legislators who are trying to make pure food laws which will be equitable, and which will at the same time protect the public health. The fraud perpetrated in these cases is a minor element; unfortunately, it is often the only offense. The ridiculous claims made for certain patent foods which are perfectly wholesome is a fraud of another order. It can be checked by a little study of dietetics and a knowledge of the ingredients, but these frauds sink into insignificance when compared to the crime of selling putrid meats in sausage and other mixtures.

BOOK REVIEWS

Helps and Hints in Nursing.—By J. QUINTIN GRIF-FITH, M.D. Family edition. Philadelphia: The John C. Winston Company, 1905.

This help in nursing contains 464 pages of text, is well printed in large type, and supplies an enormous amount of useful knowledge. The sentences are short, compact, and to the point. The entire book indicates that the author has something to say and knows how to say it briefly. As a consequence, the work is one of the best on the subject we have seen. The border line between the duties of the nurse and the physician is occasionally crossed, but this is practically unavoidable in books of this nature. The book may safely be recommended for family use as well as for nurses.

The Medical Diseases of Egypt.—By F. M. SAND-WITH, M.D., F.R.C.P. Part I. London: Henry Kimpton, 1905.

Dr. Sandwith is well qualified, by 21 years' practice in Egypt, to write a book on its medical diseases. This he has done by amplifying his lectures to the students of the Egyptian Government School of Medicine, bearing in mind the needs of three classes of readers—Egyptian students of medicine, English physicians suddenly required to assume positions of responsibility in Egypt, and those physicians in other countries who are interested in the behavior of diseases in foreign lands. Of

the 20 diseases considered in Part I, most belong to the infections. The plague and bilharziosis are particularly local in interest, the remainder including typhus, enteric fever, influenza, and the infections of childhood. Those who have read Dr. Sandwith's numerous contributions to current medical literature need not be told of the charming style in which this book is written. The book contains 816 pages, but has been made so light that its handling is a welcome relief after struggling with the weighty volumes nowadays so fashionable.

International Clinics.—Edited by A. O. J. KELLY, Volume III. Fifteenth Series, 1905. Philadelphia and London: J. B. Lippincott Company, 1905.

The departments represented in this volume are: Treatment, Medicine, Surgery, Neurology, Dermatology and Syphilis, Rhinology, Ophthalmology, and Pathology. In all, 23 articles are furnished the reader. Among the more valuable are papers on Radiotherapy by G. C. Johnston; the Opothropic Treatment of Renal Insufficiency by Professor Teissier; Serum Therapy by J. W. Wainwright; Addison's Disease by E. F. Wells; Fractures of the Patella by J. S. Wight; Paraffin Injections by the "Cold" Process by M. Broeckaert; and Cirrhosis of the Liver by Richard Kretz. Dr. Kretz well presents the newer view regarding the structure of the liver, namely, that distinct lobules are not present. His ideas of cirrhosis are outlined in this sentence: "With the recognition of cirrhosis as a focal recrudescence, chronic atrophy, modified by the invasion of parenchymatous regeneration, every reason for regarding cirrhosis as a disease entity disappears." All the papers are well worthy careful reading.

A Textbook of Diseases of Women.—By BARTON COOKE HIRST, M.D. Second edition. Philadelphia, New York, and London: W. B. Saunders & Co., 1905.

The second edition of this valuable work by Dr. Hirst has just appeared. It is written on the same lines as his "Textbook of Obstetrics," to which it may be called a companion volume. The palliative treatment of diseases of women and such curative treatment as can be carried out by the general practitioner have been given special attention, enabling physicians to treat many of their patients without referring them to a specialist. Throughout the book great stress has been laid upon diagnosis and treatment, and the section devoted to a detailed description of modern gynecic operations is without doubt the most clear and concise we have yet read. Many new illustrations have been added and old ones replaced, the work now containing over seven hundred illustrations, many of them in colors. The book is well adapted to the needs of the medical student, the general practitioner, and the specialist.

Pathology and Morbid Anatomy.—By T. HENRY GREEN. Tenth American, revised from the tenth English, edition. Revised and enlarged by W. CECIL BOSANQUET. Lea Brothers & Co., Philadelphia and New York, 1905.

The latest edition of Green's sterling work is a volume of 590 pages, containing 348 illustrations. A great deal of ground is covered in this space, which necessarily means brief consideration of many points; the book is so well written, however, that it furnishes a very complete general knowledge of pathology and can be recommended as an admirable student's textbook. For the physician, one of the more elaborate treatises would, we believe, be rather more satisfactory. The illustrations are, in general, good, though this cannot be said of those of the blood, and diagrammatic representations of typhoid and tuberculous ulcers of the intestine should be replaced

by drawings of actual specimens. The enviable reputation borne by this work, especially among English physicians, will undoubtedly be enhanced by this latest edition.

A Textbook of Clinical Diagnosis by Laboratory Methods.—By L. NAPOLEON BOSTON. Second edition, revised and enlarged. Philadelphia and London: W. B. Saunders & Co., 1905.

The favorable reception accorded the work of Dr. Boston is shown in the fact that he was asked to prepare a revision eight months after its first appearance. The principal changes are included in an addition of 17 pages. The book is a practical and valuable laboratory guide.

BOOKS RECEIVED.

(Prompt acknowledgment of books received will be made in this column, and from time to time critical reviews will be made of those of interest to our readers.)

Adjuster's Manual: For the Settlement of Accident and Health Claims.—By C. H. HARBAUGH, M.D., Medical Director American Insurance Company, etc. The Spectator Company, New York.

A Manual of Pharmacy for Medical Students.—By M. F. DELORENE, M.D., Ph.G., Instructor in Materia Medica and Pharmacy, Long Island College Hospital, etc. John C. Lindsay Company, New York, 1905.

On the Relations of Diseases of the Skin to Internal Disorders: With Observations on Diet, Hygiene, and General Therapeutics, forming a supplementary volume to every manual and textbook of Dermatology.—By L. DUNCAN BULKLEY, A.M., M.D., Physician to the New York Skin and Cancer Hospital, etc. Rebman Company, New York. Price, \$1.50.

Around the World via India: A Medical Tour.—By NICHOLAS SENN, M.D., Ph.D., LL.D., C.M., Professor of Surgery, University of Chicago, etc. American Medical Association Press, Chicago, 1905.

The Influence of the Menstrual Function on Certain Diseases of the Skin.—By L. DUNCAN BULKLEY, A.M., M.D., Physician to the New York Skin and Cancer Hospital, etc. Rebman Company, New York. Price, \$1.00.

The Prevention and Cure of Tuberculosis: A collection of articles of a popular character on the subject of tuberculosis.—Compiled by JOSEPH R. LONG. H. M. Brinker, 1905. Price, \$1.25, postpaid.

Nasal Sinus Surgery with Operations on Nose and Throat.—By BEAMAN DOUGLASS, M.D., Professor of Diseases of the Nose and Throat in the New York Postgraduate Medical School and Hospital. Illustrated with 68 full-page half-tone and colored plates, including nearly 100 figures. Royal octavo, 256 pages. Bound in extra cloth. Price, \$2.50 net. F. A. Davis Company, Philadelphia, Pa.

A Laboratory Manual of Physiological Chemistry.—By ELBERT W. ROCKWOOD, M.D., Ph.D., Professor of Chemistry and Toxicology and Head of the Department of Chemistry in the University of Iowa, etc. Second edition, revised and enlarged. With one colored plate and three plates of microscopic preparations. Large 12mo, 229 pages, extra cloth. Price, \$1.00 net. F. A. Davis Company, Philadelphia, Pa.

Sexual Neurasthenia: Its hygiene, causes, symptoms, and treatment, with a chapter on diet for the nervous.—By GEORGE M. BEARD, A.M., M.D., formerly Lecturer on Nervous Diseases in the University of the City of New York; Fellow of the New York Academy of Medicine, etc. Edited, with notes and additions, by A. D. ROCKWELL, A.M., M.D., Neurologist and Electrotherapist to the Flushing Hospital, etc. Sixth edition, with formulas. New York: E. B. Treat & Co., 1905.

Materia Medica for Nurses.—By JOHN E. GROFF, Ph.G., Apothecary in the Rhode Island Hospital; Professor of Materia Medica, Botany, and Pharmacognosy in the Rhode Island College of Pharmacy. Third edition, revised, with an appendix giving list of questions for self-examination. Based upon the eighth decennial revision of the United States Pharmacopeia. P. Blakiston's Son & Co., Philadelphia, 1905.

Genitourinary Surgery and Venereal Diseases.—By J. WILLIAM WHITE, M.D., John Rhea Barton Professor of Surgery, University of Pennsylvania, and EDWARD MARTIN, M.D., Professor of Clinical Surgery, University of Pennsylvania. Illustrated with 300 engravings and 14 colored plates. Sixth edition. J. B. Lippincott Company, Philadelphia and London, 1905.

Minor and Operative Surgery, Including Bandaging.—By HENRY WHARTON, M.D., Professor of Clinical Surgery in the Woman's College; Surgeon to the Presbyterian Hospital, Philadelphia, etc. New sixth edition, enlarged and thoroughly revised. In one 12mo volume of 642 pages, with 532 illustrations. Cloth, \$3.00 net. Lea Brothers & Co., Publishers, Philadelphia and New York, 1905.

AMERICAN NEWS AND NOTES

GENERAL.

Union Men for Pure Food.—The pure food crusade is being taken up by the Federation of Labor and an investigation of the manufacture and sale of adulterated products is authorized. It is hoped to bring to the attention of 150,000 organized workingmen and their families some of the evils resulting from the violations of the pure food laws of Illinois.

Hearing on Quarantine.—The Mallory-Williams bill for the extension of Federal control of quarantine was discussed last week before the House Committee on Interstate and Foreign Commerce by a delegation of Louisianians headed by Martin Behrman, mayor of New Orleans, which urged that national control of quarantine is the only possible means of bringing about uniform quarantine regulations and preventing conflicts between the States. Senator Foster, of Louisiana, and many southern members of the House attended the hearing.

Drug Trust in Congress.—Representative Gillespie, of Texas, introduced a resolution for an investigation by the Department of Commerce and Labor of the Proprietary Association of America, the National Wholesale Druggists' Association and the National Association of Retail Druggists, which are said to be discriminating against John W. Jennings, a Washington druggist, because of his failure to affiliate with the District of Columbia Retail Druggists' Association, the local branch of the National Association of Retail Druggists. It is alleged the organizations named are violating the anti-trust act.

Personal.—All Hanover's (Pa.) physicians and many others united to celebrate the fiftieth anniversary of Dr. Oliver T. Everhardt's practice in that town.—Elizabeth Bricker and C. H. Nuschitz have been appointed assistant physicians at the Philadelphia Hospital. William J. Wahn, who recently resigned as nuisance inspector, was made a clerk in the bacteriological department.—J. B. Mickle, superintendent of the Metropolitan Hospital on Blackwell's Island, New York, since December 21, 1903, has resigned because of failing health.—George C. Signor, a former hotel proprietor, has succeeded J. E. Ellis as superintendent of the Medico-Chirurgical Hospital, Philadelphia. Mr. Ellis will start at once for Florida, and after a month's vacation will go to New Orleans as superintendent of the Touro Hospital.—H. J. Boldt, of New York City, has been sued by a patient for \$25,000 for having, she alleges, allowed a gauze pad to remain in the abdomen after an operation.

New Hospitals to be Erected.—A new hospital to cost \$200,000 is to be built by the Chicago Lying-in Hospital and Dispensary. Plans are being made for a nurses' dormitory for the Mary Thompson Hospital for Women and Children, to accommodate 31 nurses, and to cost about \$20,000. Plans have been prepared for the Cribside Pavilion, to be erected in connection with the Chicago Memorial Hospital, to cost about \$40,000.—The New York Association for Improving the Condition of the Poor has received from John D. Rockefeller an offer of \$125,000 toward the erection of a permanent seaside hospital for little children suffering from tuberculosis of the bones and glands, on two conditions: (1) That the association raise a like amount from other givers by June 30, 1906; and (2) that the permanent maintenance of the hospital be assured. Toward the first condition three men have promised \$5,000 each, one man \$2,000, and an anonymous giver \$25,000.—A gift of \$10,000 was made to the German Hospital in Williamsburg, N. Y., by Peter Wyckoff, whose ancestors settled in the vicinity of Johnson and Flushing avenues more than 200

years ago. The old homestead still stands in its original place. About two weeks ago Mr. Wyckoff distributed \$50,000 among five charitable institutions in Brooklyn.

EASTERN STATES.

School Children's Health.—The committee on education of the Massachusetts legislature last week gave a hearing on two measures for the better protection of the health of school children, one on the bill accompanying the petition of Richard C. Cabot, representing the Massachusetts Medical Society, and the other on the petition of Representative T. L. Davis, of Salem. Dr. Durgin, of the Boston Board of Health, spoke in favor of the propositions and told how in Boston there had been a large decrease in sickness among the school children as a result of proper supervision and told how diphtheria had been fought by the use of antitoxin. George H. Martin, of the State Board of Education, presented many facts and figures in support of an enforced medical examination, especially regarding the eyes and ears.

Hearing on Vivisection.—The bill to prohibit vivisection was discussed in committee of the Massachusetts legislature last week. Hon. Samuel L. Powers appeared as counsel for the petitioners, and introduced a large number of petitions from clergymen of all denominations all over the State in support of the bill. Senator Cummings said he is in favor of the idea of the bill, but feared that the bill as introduced goes too far. The bill was opposed by Dr. Ernst, of Harvard, Professor Sedgwick, of the Massachusetts Institute of Technology, and by Professor Arnold, of Tufts, who contended that the work of vivisection as done by them is not in any way cruel, but is carried on in the interests of humanity in disclosing to science a great many new things about the makeup of bodies and life. They said the passage of the bill would seriously impair the work of their departments in the various colleges.

NEW YORK AND VICINITY.

Yonkers Has an Epidemic.—Throughout Yonkers, N. Y., more than 1,000 persons are suffering from follicular tonsillitis. The symptoms closely resemble those of diphtheria. Many prominent persons have been laid up with the disease.

More Paid Doctors for Bellevue.—As a result of action taken at a meeting of the Board of Trustees last week, Bellevue Hospital will hereafter have four paid physicians in its reception ward. They will receive a salary of \$600, and serve in four-hour tours of duty. Hitherto this duty has fallen to the internes who are at the hospital finishing their medical study and working without pay.

Puts Ban on Miss Hall's Theory.—A bill has been introduced into the New York Assembly providing that any person "who by word of mouth, or by written or printed circulars, message, letters, documents, pamphlets, newspaper or magazine articles or publication of any kind, made, issued or circulated by him or his authority, advocates or teaches the duty, necessity or propriety of putting to death by legal sanction or otherwise, persons afflicted with an incurable mental or physical disease, because of their said condition, is guilty of a felony."

New Rules for New York College of Physicians and Surgeons.—A change in the regulations of the summer session of the College of Physicians and Surgeons has been made which will permit undergraduates to count for their degrees some of their summer work. In the past two years no credit has been given for summer-school attendance, its purpose being merely to enable students to make up back work and to prepare for the coming year. The authorities are now anxious to have the men work at their specialties during the summer, thus lightening the regular winter schedule. The courses in the summer session, which is open to grad-

uates as well as undergraduates, will be held from the latter part of May until July.

Field Hospital for National Guard.—The New York National Guard will have a field hospital, to be attached to headquarters. Orders for its organization will be issued in a few days. This new hospital will be used in caring for the sick and wounded when the guard is in camp or performing riot duty or on other service. The new hospital will not in any way interfere with the present regimental hospital corps. The field hospital will be equipped with all the latest government supplies, such as ambulances, wagons, stretchers, cots, etc. It will consist in time of peace of 4 officers and 46 enlisted men. Dr. William S. Terriberry, of the Twelfth regiment, who served as a medical officer in the war with Spain, will, it is understood, command the new field hospital, and will be assisted by Dr. William E. Butler, of the Twenty-third regiment, and Dr. T. A. Neal, late of the Seventh regiment. The fourth officer has not yet been selected.

Opposition to Osteopaths.—Some of the best known physicians in New York appeared before the Senate Judiciary Committee in opposition to the Davis bill to recognize osteopathy, by creating an examining board under the regents. The principal speakers opposed to the measure were Drs. Abraham Jacobi, Algeron Bristow, and Frank Van Fleet, Edward O'Brien, attorney for the Medical Society of Erie county, and Dr. Moriarity, of Saratoga, family physician of Senator Brackett, chairman of the committee. They contended that the bill as framed would give the persons now practising osteopathy recognition as doctors without any special education or training. Dr. Jacobi said he had no objection to osteopathy in itself, but demanded that a person practising it be first a graduated physician, as required of hydropaths and homeopaths. He thought all practitioners relying on a one-remedy system should be weeded out. Dr. Bristow pointed out that the bill did not require a study of toxicology, and a practitioner might not be able to find out, if a patient had a stomach ache, whether he was suffering from poison or appendicitis.

PHILADELPHIA, PENNSYLVANIA, ETC.

Health Talks to Teachers.—The Chester County Teachers' Association at their annual meeting was addressed by Dr. Samuel G. Dixon, State Health Commissioner, upon the bearing of health upon education.

Smallpox Outbreak at Tuscarora.—Smallpox has broken out at Tuscarora. Five physicians have just finished vaccinating the inhabitants of the entire town. Two insurance agents, who were driving through the place, were held up and compelled to be vaccinated.

Five Hundred Authorized as Pharmacists.—Names of more than 500 successful applicants for certificates as registered pharmacists and qualified assistants who were examined recently by the Pennsylvania State Pharmaceutical Board, were made public last week; 701 students appeared before the board.

Typhoid and Measles in Philadelphia.—New cases of typhoid fever to the number of 352 have been reported to the health authorities this week, an increase of 12 over the number reported last week. There are now 2,650 cases of the fever under treatment here. Health inspectors also heard of 633 new cases of measles.

Would End Autopsy Fees.—The court of Chester county is to be called upon to make a ruling in the matter of postmortem examinations in cases of sudden deaths. In a recent case after holding an inquest the jury decided to refuse to accept its fees and ordered the bill for the postmortem handed to the County Commissioners, who have refused to pay it,

but the body will be interred at the order of the jury and deputy coroner. Two recent postmortems have been performed in what were considered ordinary cases, in which the history was well known, and the commissioners refused to pay out the money.

Must Win the Pollution Suit.—So much depends on the outcome of the case against E. O. Immel, the Pottstown dye mill proprietor, who is charged with polluting the water, that the State Fish Commission has employed five attorneys to fight its case when it comes up in court. Many witnesses are being subpoenaed. If the Fish Commission loses this test case, other contemplated prosecutions against manufacturers whose plants pollute the water will be abandoned.

Places for Veterinarians.—Director of Health Coplin has announced that he proposes to place the Bureau of Meat and Cattle Inspection on a more scientific basis by the appointment in the future of only veterinary surgeons as meat and cattle inspectors. In pursuance of this plan he asked for the resignations of the present corps of inspectors. The positions will be filled within a week by the appointment of veterinary surgeons, subject to a civil service examination.

SOUTHERN STATES.

Vaccinated 300 Prisoners.—All of the 300 inmates of the county workhouse, near Wilmington, Del., were vaccinated last week, as the result of the illness with smallpox of a prisoner.

WESTERN STATES.

May Inspect Papers.—According to the opinion of the Attorney-General of the State of Oregon, any unsuccessful candidate before the State Board of Medical Examiners has a right to see his markings. The Attorney-General holds that the unsuccessful applicant, or his agent, has a right to examine the markings of his paper in order that the right of appeal to the courts shall not be denied him, should there be any question as to the fairness of the examination markings.

Forcibly Upsets Faith Cure.—The corporation counsel of the Chicago Board of Health has rendered a decision that the city health department is justified in forcibly interfering in cases of extreme sickness where the services of a physician are refused by relatives of the invalid. The life of a woman was in peril, her condition calling for an immediate operation. Instead of calling a physician, her husband and relatives appealed to Overseer Voliva, of Zion City, who sent one of his deacons to pray for the patient. The woman's cries of pain attracted a neighbor, who reported the case, and the health department sent a physician to attend the woman.

For Increased Life Insurance Examination Fees.—At a meeting of the Teller County, Colo., Medical Society, held February 22, 1906, the following resolutions were adopted and signed by every practising physician in Teller county:

WHEREAS, In consideration of the time, skill, and care necessary for an examination for life insurance, we deem that the fee of five dollars (\$5.00) is a fair, reasonable, and just charge for such examination; therefore, be it

Resolved, That on after April 1, 1906, each and every member of the Teller County Medical Society shall not make any examinations for old line life insurance companies for less than the sum of five dollars (5.00); and be it further

Resolved, That such life insurance companies as are now paying less than five dollars (\$5.00) be notified by the secretary that on and after April 1, 1906, no regular life insurance examinations will be made by any members of this society for less than five dollars (\$5.00); and be it further

Resolved, That any member who violates this resolu-

tion shall be suspended from the society; and be it further

Resolved, That it shall be unlawful for any member of this society to consult with any physician so suspended.

CANADA.

To Entertain the British Medical Association.—Physicians of Toronto, representing the local branch of the British Medical Association, appeared February 7 before the premier and the provincial cabinet to ask for assistance in entertaining the association next August, \$7,500 being the amount requested. The Dominion government has partially promised \$10,000, and the city of Toronto is expected to contribute \$5,000.

FOREIGN NEWS AND NOTES

GENERAL.

Need of Good Conditions.—Measurements made in London schools show that the children's stature, as well as their weight, increases regularly in passing from the poor to the well-fed and well clothed.

Reported Serum Treatment for Dysentery.—The Therapeutic Institute of Austria announces the discovery of a new serum for the alleviation of dysentery. Experiments are said to have resulted in much alleviation within 24 hours.

OBITUARIES.

Joseph Edgar Wells, aged 40, February 26, at his home in Brooklyn, N. Y. He was graduated from Jefferson Medical College in 1887, and had been in practice for 18 years. He was a member of the Kings County Medical Society and the American Medical Association.

Samuel Doolittle Brooks, aged 90, February 26, at his home in Springfield, Mass. He was graduated from Berkshire Medical College, Pittsfield, Mass., in 1841. For 15 years he served as superintendent of the New York Juvenile Asylum.

Lawrence G. Mitchell, aged 44, of Downing's, Va., February 27, at the home of his brother-in-law at Sharp's Wharf. He was graduated from the University of Maryland School of Medicine in 1884.

A. R. Cobb, aged 33, of Philadelphia, March 8, at the Hahnemann Hospital, from a fall from a second-story window. He was graduated from Hahnemann Medical College in 1891.

John Pugh, of Napoleonville, La., February 2, at the home of his daughter on the Oakley plantation. He was graduated from Tulane University, New Orleans, in 1853.

Samuel Breitenbach, aged 81, February 27, at his home in Philadelphia. He was graduated from the College of Physicians and Surgeons, New York City, in 1848.

William F. Drake, aged 39, March 1, from an overdose of morphin, at his home in New York City. He was graduated from the New York University in 1889.

Robert C. Hutchinson, February 27, from pneumonia, on the American liner St. Louis, while at sea. He was graduated from the University of Pennsylvania.

W. T. Campbell, aged 80, March 4, at his home in St. Louis, Mo. He was graduated from the Saginaw Valley Medical College, Saginaw, Mich., in 1899.

George W. Pleasanton, February 26, suddenly, at his home in Milford, Del. He was graduated from Jefferson Medical College in 1876.

William Hill, aged 77, March 1, at his home in Bloomington, Ill. He was graduated from Jefferson Medical College in 1856.

THE PUBLIC SERVICE

Changes in the Medical Corps of the U. S. Army
for the two weeks ended March 3, 1906:

First Lieutenant HOWARD H. BAILY, assistant surgeon, is relieved from duty at Camp Keithley and will proceed to Camp Vicars, Mindanao, for duty.—The following-named officers are assigned to duty as follows: First Lieutenant SAMUEL M. DELOFFRE, assistant surgeon, to Camp Jossman, Guimaras, for duty.—First Lieutenant ROBERT M. BLANCHARD, assistant surgeon, to Gandara, Salmar, for duty, relieving Contract Surgeon T. Ogier Hutson, who will proceed to Taviran, Samar, for duty.—EDGAR J. FARROW, contract surgeon, to Balamban, Cebu, for duty at that station and substations, relieving Contract Surgeon Herbert W. Yemans, who will proceed to Camp Warwick, Cebu, for duty.—Major HENRY S. T. HARRIS, surgeon, is relieved from further temporary duty at Camp Jossman, Guimaras, and will proceed to Iloilo and assume command of the base hospital, relieving Major William E. Purviance, surgeon.—EDGAR J. FARROW, contract surgeon, will proceed to Tagbilaran, Bohol, for duty.—Captain ALEXANDER N. STARK, assistant surgeon, now stationed at Camp Stotsenburg, Pampanga, is relieved from duty in the department of Luzon, and will proceed to Manila, reporting to the commanding officer, division hospital, for duty.—The following-named officers having arrived on the transport Buford, January 15, will report as follows: First Lieutenant WALLACE DE WITT, assistant surgeon, to the commanding general, department of Luzon, for assignment to duty.—First Lieutenant HERBERT C. GIBNER, assistant surgeon, to the commanding officer, division hospital, for temporary duty.—Major ROBERT S. WOODSON, surgeon, is granted leave for one month.—EDWARD BAILEY, contract surgeon, is granted leave for four months.—ARCHIBALD ROBBINS, sergeant first class, Philippine Islands, will be relieved from further duty in the Philippines Division at such time as will enable him to be sent to San Francisco, Cal., on the first transport leaving Manila after May 15. Upon arrival at the depot of recruits and casuals, Fort McDowell, Cal., he will report by letter to the military secretary of the army for orders.—STEPHEN M. LONG, contract surgeon, is granted leave for one month, to take effect upon his arrival at San Francisco, Cal.—CHARLES W. CRAMER, sergeant first class, will be placed upon the retired list upon his own application.—Captain THOMAS J. KIRKPATRICK, assistant surgeon, is granted leave of absence for one month, from about February 20.—THOMAS M. ENGLAND, sergeant first class, is relieved from further duty in the Philippines Division and will be sent to San Francisco, Cal. Upon arrival at the depot of recruits and casuals, Fort McDowell, he will report by letter to the military secretary of the army for orders.—CLEMENS W. MCMILLAN, contract surgeon, is relieved from duty at Fort Terry and will proceed to Fort Trumbull, relieving Contract Surgeon John M. Feeny, who will proceed to Fort Terry for duty.—JOHN S. MARSHALL, contract examining and supervising dental surgeon, Army General Hospital, Presidio of San Francisco, Cal., will proceed to Honolulu, H. T., on the army transport sailing about February 15, for temporary duty. Such dental treatment as is necessary will be completed as far as possible in time to enable Dental Surgeon Marshall to return to San Francisco on the transport leaving Honolulu about March 26.—Major WILLIAM STEVENSON, surgeon, is granted leave for one month.—FRANCIS M. WELLS, contract surgeon, is relieved from duty in the Philippines Division, and will proceed to San Francisco, Cal., and report by telegraph to the military secretary of the army for further orders.—CHARLES T. LOEBENSTEIN, sergeant first class, now at the General Hospital, Pre-

sidio of San Francisco, Cal., will be sent to Benicia Barracks to relieve Sergeant First Class Carl Graner. Sergeant First Class Graner will be sent to Vancouver Barracks for duty.—ARTHUR I. BOYER, contract surgeon, will proceed from Kingsbridge, N. Y., to Fort Jay and report to the commanding officer of the Eighth Infantry at that post, for duty to accompany that command to the Philippine Islands, and upon arrival at Manila will report to the commanding general, Philippines Division, for assignment to duty. WILLIAM H. COOK, contract surgeon, will proceed from Gravesend, N. Y., to Fort Niagara and report to the commanding officer of the Eighth Infantry at that post, for duty to accompany that command to the Philippine Islands, and upon arrival at Manila will report to the commanding general, Philippines Division, for assignment to duty.—JOSEPH WATERS, sergeant first class, will be placed upon the retired list upon his own application.—HUGO C. RIETZ, dental surgeon, Fort Sheridan, will proceed to Fort Thomas for duty.

Changes in the Medical Corps of the U. S. Navy
for the week ended March 2, 1906:

J. G. FIELD, surgeon, ordered to the Bureau of Medicine and Surgery, Navy Department.—F. D. CHAPPELEAR, acting assistant surgeon, appointed acting assistant surgeon from February 28, 1906.—F. S. NASH, surgeon, detached from the Oregon and ordered to the Rainbow.

Changes in the Public Health and Marine-Hospital Service for the week ended February 28, 1906:

W. J. PETTUS, assistant surgeon-general, granted leave of absence for one month from March 1, 1906.—G. M. MAGRUDER, surgeon, upon expiration of leave of absence to proceed to Portland, Ore., and assume command of the service.—J. A. NYDEGGER, passed assistant surgeon, to proceed to Perth Amboy, N. J., for special temporary duty, upon completion of which to rejoin station at Stapleton, N. Y.—L. E. COFER, passed assistant surgeon, granted one day leave of absence under paragraph 189 of the regulations.—W. A. KORN, passed assistant surgeon, granted leave of absence for fourteen days from March 2, 1906.—J. D. LONG, passed assistant surgeon, granted seven days' leave of absence in December, 1905, under paragraph 191 of the regulations.—J. T. BURKHALTER, passed assistant surgeon, upon being relieved by Assistant Surgeon R. D. Spratt, to proceed to Ellis Island, N. Y., reporting to the medical officer in command for duty.—R. D. SPRATT, assistant surgeon, relieved from temporary duty at Mobile, Ala., and directed to proceed to Brunswick Quarantine Station and assume command of the service, relieving Passed Assistant Surgeon J. T. Burkhalter.—J. M. DELGADO, acting assistant surgeon, granted four days' leave of absence from February 13, 1906, under paragraph 210 of the regulations.—W. E. KURTZ, acting assistant surgeon, granted leave of absence for thirty days from January 1, 1906, on account of sickness.—N. D. RICHARDSON, acting assistant surgeon, granted leave of absence for fourteen days from January 27, 1906, on account of sickness.—M. V. SAFFORD, acting assistant surgeon, granted three days' leave of absence from February 17, 1906, under paragraph 210 of the regulations.—T. V. O'GORMAN, pharmacist, relieved from duty at New Orleans, La., and directed to proceed to Memphis, Tenn., reporting to the medical officer in command for duty and assignment to quarters.—E. B. SCOTT, pharmacist, granted two days' leave of absence from February 21, 1906, under paragraph 210 of the regulations.

Board Convened.—Board convened to meet at the Bureau, Washington, D. C., February 24, 1906, for the purpose of making a physical examination of an officer of the Revenue Cutter Service. Detail for the board: Assistant Surgeon-General W. J. Pettus, chairman; Assistant Surgeon J. W. Trask, recorder.

SOCIETY REPORTS

THE SOUTHERN SURGICAL AND GYNECOLOGICAL ASSOCIATION.

Eighteenth Annual Meeting, Held in Louisville, Ky.,
December 12, 13, and 14, 1905.

[Specially reported for *American Medicine*.]

[Continued from page 307.]

Traumatism of the Ureter and Pelvis of the Kidney.—RUFUS B. HALL (Cincinnati, Ohio) read a paper on this subject, in which he reported two cases, and said that the ultimate results were so satisfactory that he hoped they might be of sufficient interest to warrant their recital in detail. The exact location of the injury was not determined in either case. The first patient was a girl, aged 9; the second, a male, aged 17. In reviewing the history of the first case, he was inclined to believe that there was a free rent either in the pelvis of the kidney or in the ureter. In the second there was a narrow opening either in the ureter or the pelvis of the kidney, from which urine leaked very slowly at first. In this case rupture had taken place evidently on September 10. It was more than 10 days later before urine was extravasated to make a palpable tumor so that it could be outlined. On November 1 the tumor appeared to be not larger than the boy's head. Both patients were relieved by operation, with drainage.

Aneurysm Treated by Suture Inside the Sac.—F. W. PARHAM (New Orleans, La.) read a paper on this subject, in which he reported two cases treated after the method of Matas. One was an idiopathic aneurysm of the popliteal artery; the other, an aneurysm of the second and third portions of the left subclavian. The popliteal aneurysm was treated by suture inside the sac of proximal and distal openings separately and continuous suture of the groove of the artery intervening. In the subclavian case only the proximal opening was sutured, the distal bleeding being controlled by ligatures. Both patients recovered. The indications for this procedure were: (1) The practicability of laying open and inspecting the interior of the sac; (2) the possibility of applying a constrictor, clamp, or temporary ligature to the proximal side of the tumor. In the second case reported the suture was employed because the proximal ligature failed to stop the bleeding completely. The operation of suture within the sac was to be preferred to ligature, because: (1) Every possible bit of artery was saved except that actually forming the sac of the aneurysm; (2) suture accomplished simple approximation of the intima, and did not cut through as might happen with ligature of an atheromatous artery; (3) all collateral bleeding in the sac was stopped by direct suture of the vessel mouths within the sac, and packing of the sac became unnecessary; (4) hence there was no disruption of the outside vascular (collateral) connections of the sac wall, already much relieved by the emptying of the sac. The reconstruction of the artery was to be attempted only in certain cases, as in aortic aneurysm, where suture of the proximal opening would, like ligature, probably be fatal, and in other aneurysms where from swelling and lymphangitis, as in Morris' case, the danger of gangrene was too great to risk any interference with the nutrient stream. In such case reconstruction of the artery might be preferred for two reasons: (1) Because even a temporary continuance of the main stream would be a great advantage until the subsidence of edema consequent upon the evacuation of the sac shall have somewhat relieved the stress upon the collateral vessels; (2) because, as remarked by Matas and shown in Dana's case, it was feasible at a secondary operation to again open the sac and close the arterial opening. In abdominal aneurysms the method of Matas offered some hope of cure.

The Dangers in Scopolamin-Morphin Anesthesia.—HORACE J. WHITACRE (Cincinnati, Ohio) read a paper with this title, in which he based his conclusions upon observations made in 40 cases of anesthesia induced by this method, upon animal experimentation, and upon a review of all deaths that have been reported in the literature up to the present time: (1) Scopolamin-morphin narcosis is not devoid of danger; (2) the use of scopolamin-morphin alone for surgical narcosis is not justifiable, and in my experience is not practicable; (3) a single dose two hours before operation lessens the discomforts attendant upon the operative procedure to a high degree, and may obtain a definite place in surgical practice; (4) four deaths have occurred in a series of 2,400 collected cases which have been so definitely related to the use of this method of narcosis that they are probably scopolamin deaths; this, however, in the absence of autopsy demonstration; (5) these deaths have been reported as occurring with a type picture of alkaloid poisoning, and heart failure has been given as the direct cause of death; (6) a fatty degeneration of the liver and kidney has been produced by repeated doses of scopolamin alone and of the scopolamin-morphin combination in animals; (7) this method of producing or assisting narcosis cannot yet be recommended for use in general practice, in spite of the great advantage it seems to offer.

[To be continued.]

WESTERN SURGICAL AND GYNECOLOGICAL ASSOCIATION.

Fifteenth Annual Meeting, Held in Kansas City, Mo.,
December 28 and 29, 1905.

[Specially reported for *American Medicine*.]

[Continued from page 307.]

Treatment of General Peritonitis.—DONALD McRAE, JR. (Council Bluffs, Iowa) read a paper on this subject, in which he advocated the Fowler position in all suspected peritoneal infections; also the institution of free drainage at the time of the operation by means of large-sized rubber tubing only. Drainage of the most dependent part of the pelvic peritoneal pocket was imperative. He urged the removal of the primary pathologic factors when possible, and spoke against the use of gauze and flushing. He said the drainage-tube should be sucked at frequent intervals.

Treatment of Appendicitis.—O. BEVERLY CAMPBELL (St. Joseph, Mo.) followed with a paper on this subject, in which he drew the following conclusions: 1. In incipient appendicitis, until the patient was placed in the hands of the surgeon, all food and drink should be withheld, and the patient nourished per rectum. 2. Every patient should be advised of the advantages of an early operation. 3. Radical work, that is, the removal of the appendix, or the closure of an opening in the cecum, should be made in abscess cases when it could be done without additional risk to the life of the patient. 4. The practice of merely draining in every abscess case should be condemned as nonsurgical. 5. Operation during a progressive diffuse peritonitis was attended with a higher mortality than the method of procedure recommended by the writer. 6. If the internist would direct his efforts in the treatment of appendicitis toward the protection of the peritoneum until he could transfer his case to the surgeon, the mortality in this disease would be greatly lessened. 7. The adoption of the more rational method of dealing with diffuse peritonitis would convert a large percentage of these cases into circumscribed peritonitis, when they could be rightly classed as large abscess cases, having the same mortality.

Treatment of Appendicitis in Its Various Stages as it Comes to the Surgeon.—C. H. WALLACE (St. Joseph, Mo.) contributed a paper with this title, and summarized by saying: (1) That appendicitis was alw

surgical disease; (2) that every case should have, and was entitled to, operative measures within the first 48 hours; (3) the rapidly progressing stage was the stage of applicability of the Ochsner treatment, and by it offered the lowest mortality; (4) cases coming to the surgeon with evidence of gradually subsiding symptoms should be deferred for a more favorable operative period; (5) that every interval, or chronic case should be urged to the operating table; (6) that abscess cases should be given two safe, rather than one hazardous operation; (7) that diffuse peritonitis should have all accumulated, dependent cavities primarily and carefully incised and drained, and not flushed; and secondarily the offending organ incised. VAN BUREN KNOTT (Sioux City, Iowa) followed with a paper in which he set forth his ideas at great length concerning the management of appendicitis, based upon a thousand operations.

Extrauterine Pregnancy.—J. W. ANDREWS (Mankato, Minn.) read a paper on this subject, in which he reported having operated upon a woman who was 10 weeks pregnant; the sac ruptured, and the operation was delayed 36 hours. The case was reported in detail. The steps of the operation he performed were not very different from an ordinary laparotomy. He counseled accuracy and rapidity in operating on these cases, and emphasized the necessity in many cases of thrusting the hand down through the pool of blood and securing the bloodvessels before attempting to mop out, or otherwise remove the blood and blood clots. He thought drainage, as a rule, should be employed after laparotomy for extrauterine pregnancy.

Gunshot Injuries of the Stomach.—J. N. WARREN (Sioux City, Iowa) gave the history and analysis of 144 cases of gunshot injury of the stomach. He spoke of the character and location of the lesion in uncomplicated cases in determining the prognosis. In operated cases, the time elapsing from the time of injury and the operation showed that the earlier the operation was performed the more favorable was the result. In complicated cases the number of lesions found and viscera injured added to the gravity of the case. He spoke of the results in the cases that were not operated. He said the presence of food in the stomach with the discharge of the same into the abdominal cavity added to the danger of general peritonitis, either with or without operation.

The Symptoms of Spinal Disease.—S. C. BALDWIN (Salt Lake City, Utah) called attention particularly to the early symptoms of spinal disease in order that suffering may be earlier relieved and deformity avoided. The general or more common symptoms, and then such symptoms as rigidity, gait, pain, paralysis, abscess, etc., were considered. The symptoms differed when different regions of the spine were involved. For instance, in the cervical region the first symptom noticed might be pain in the head, and, according to Whitman, earache might be a symptom of cervical disease. Before there was any sign of deformity the patient might complain of difficulty in swallowing and even in breathing. In the cervical region there might be, and often was, the grunting respiration. Such general symptoms as weakness, loss of appetite, loss of weight, rigidity, and general change of gait in walking, were apparent in disease of all parts of the spine. The writer had seen a number of cases of Pott's disease developing in patients over 40, and two cases which he recalled developed after 50. Weakness might show itself in a general drooping of the trunk, in an unsteady and stumbling gait, and exhaustion requiring rest after the slightest exertion.

Postclimacteric Hemorrhages; Their Cause and Treatment.—A. L. WRIGHT (Carroll, Iowa) called attention to the frequency of occurrence of postclimacteric hemorrhage after the establishment of the menopause. He spoke of how often it was passed over slightly, with the thought that it was incident to the woman's age until grave complications were at hand, or the true cause—carcinoma in most instances—was so far advanced as to

place the patient beyond the pale of surgical interference. He called attention to the several changes that take place in the uterus at this time and cause hemorrhage. The trend of the argument was to early recognize the pathologic changes taking place in the uterus, and if in doubt remove the organ rather than take chances that would invariably result in death.

Appendicitis.—I. B. PERKINS (Denver, Colo.) read a paper in which he gave further reports from physicians who had suffered from this disease. He discussed the diagnosis of chronic appendicitis and of the prodromic stage in acute cases. He expressed himself in favor of early operation in all cases. The interval cases should be operated. Fatalities were usually chargeable to delay. The management of delayed cases was discussed; also the attitude of the profession and of the public toward operation.

[To be continued.]

CLINICAL NOTES AND CORRESPONDENCE

[Communications are invited for this Department. The Editor is not responsible for the views advanced by any contributor.]

A PLEA FOR A RATIONAL PRESENTATION OF SUBJECT IN DIDACTIC LECTURES IN MEDICINE AND SURGERY: A STUDENT'S POINT OF VIEW.

BY

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At the present time, when there is so much discussion and such varied opinion among teachers concerning the relative value of clinical and didactic methods of teaching, perhaps a word showing the student's point of view may be of interest. This article was planned before I had graduated from the medical school, was written while I was a hospital interne and, therefore, fairly represents the point of view of the student just graduated, presenting his criticism of a part of his training and offering his suggestion for its improvement.

Of late years there has been an increasing tendency to substitute bedside teaching, laboratory instruction, and individual experiment for class-room orations. And doubtless this is practical and wise. But some go so far as to deny the value of any didactic teaching whatever; these would abolish the lecturer—and with them I cannot agree. I believe that the field of usefulness of the didactic lecturer is, if not large, at least very important. And I am sure that the spirit of his speech and the intention of his work have a deep and lasting influence upon his pupils. But I know that upon the method of presentation of his subject to his hearers much of the value of his teaching depends. He should be the leading spirit, the guiding hand, the pointing finger. It is in his power to lay the cornerstone of our foundation, to set the keystone to our arch.

The way of the lecturer is hard. Probably he recognizes this oftener than anyone else. But his hearers are perhaps in a better position to say whether it is effective. Only at examinations, or at other times when they are asked to give back what they have got from him, can the teacher form any fair estimate of his professional value to his scholars. They, on the other hand, can tell at the end of each hour whether they know more than they did at the beginning and, what is more significant, whether they *want* to know more. Appetite is often the precursor of a good digestion.

Knowledge of his subject, experience, some originality, a recognized scientific or professional standing are the main characteristics required by his electors of a man chosen to head a department in a medical school. Students demand more than this of the man they have to learn from. They ask that he be interesting. They

not only to possess knowledge, but to be able
 to use it in some such form as they can
 use. They need tools that they can use.
 The content of any lecture is a variable
 quantity. The unstable mental ratio be-
 tween the former, never so
 stable, and the latter, without the latter
 mental enthusiasm the
 result will inevitably

student, and speak from his school anxious to how to learn; ten nk! During his first upon him such a cold warm young enthusiasm wishes very much that he col—may even have doubts as to enter it, and hesitatingly per- if he has not overestimated his that he ever could learn to be a if he is made of the right stuff he he has done as much as he has done, if with the remembrance of friends who ore, hopes the worst is over, and continues ward the goal.

studied, and perhaps learned something of in the dissecting-room, of physiology in lecture demonstration, of pathology in the class-room, of bacteriology in the bacteriologic laboratory. Moreover, he is learning and is to learn something of symptoms at the bedside; of course and prognosis and diagnosis by watching and listening and reading, and of treatment in the hospitals. These things he has studied or is to study at different times, and here is the point, as different subjects separate and divide from one another! He has been, or will be at different times, by turns an anatomist, a physiologist, an etiologist, a pathologist, a symptomatologist, a prognostician, and a therapist. What is one among so many? Divided thus he falls into bad habits of taking things for granted, of not thinking for himself. Wisdom sown in such whirlwind fashion falls often upon stony ground.

From the travail of his two years' floundering in the sea of many waters of knowledge have been born two realizations which ought to help smooth the way to real progress; he has learned how little he knows and how much there is to be known, and he has begun to recognize the unfortunate fact that he has never been taught to think.

No man can have much knowledge without taking thought, and the third-year student, let us say, not only desires to *want* to think, but desires to know *how* to think; he not only asks to be interested, but to be told how to turn his interest to account.

If this poor student only knew how to think for himself, he could put together the scattered fragments of his learning and find that they formed a whole, more or less incomplete to be sure, but greater at least than any of its parts. He could, in some sort, correlate the separately conned lessons of his trade, and from the liberated energy in the coalescence of widely distributed elemental constituents strike a light in the comparative clearness of which he might walk far more safely and surely and speedily toward the end and aim of his labor and intent, the intelligent diagnosis and treatment of disease.

But, unfortunately, he does not know how to think. Certainly this is a deplorable fact, but it is surely better to try to meet the condition than to waste time deploring it, and I believe the broadest and shortest and straightest way to meet it lies in the path of the lecturer.

This is no essay "ex cathedra," no formal arraignment of a system, but a simple exposition of what I

believe to be a common result of a certain widely used method of teaching in class-room and laboratory, and a certain long-established method of presentation of subject in textbook and lecture; and, therefore, I may be permitted to address my plea most respectfully, and with a growing knowledge of the difficulties against which they are so conscientiously contending, to those whom I have looked up to and do look up to as my teachers. This, gentlemen, is an attempt to suggest to you how you can help us even more than you have already done. This brings us back to where we started; the student wants his teacher to be interesting.

There are a hundred ways of being interesting—some excite interest by appearance, manner, and carriage; others by voice, gesture, and deportment; others again by a subtle magnetism that defies analysis; and a few only by the subject-matter of their speech and the method of its presentation.

This is the way that appeals to the student. He has a lot of blocks and wants to be told how to put them together and build something out of them. Let us get our cold, hard, indigestible facts from the books, the laboratories, and the demonstration rooms, and do you make your lectures the warm sauce piquante that shall arouse the appetite and stimulate the flow of the mental digestive juices to dissolve and disintegrate them till we can build them up into a firm, useful body for our medical selves.

If the presentation of the subject be logical, it will go far toward making it interesting, and the following method seems to me to be more logical than the one now in use :

1. *Definition.*—After you have given us a definition, after you have told us what you are going to talk about, begin with something that we can all see or feel or hear ; begin with what we shall all have to begin with later on—symptoms.

2. *Symptoms.*—Here a very broad interpretation should apply, including under this head a history of present illness, as well as of its onset, together with the physical signs, clinical symptoms and clinicopathologic expressions of the disease after it has become sufficiently well established to warrant an attempt at diagnosis. Here the personal equation cannot but come strongly into evidence; still, from a considerable experience in *listening* to lectures, I should say it were unwise, in orally describing the manifestations of a disease, to go too greatly into detail. Descriptions of uncommon symptoms, rare physical signs and unusual clinicopathologic reactions can generally be found in the books and cannot, generally, be held in the head. Even if you make a picture of it, and that is what we like to have you do, unless it be drawn with the most masterly skill, only the foreground remains in our remembrance.

In the minds of most students, the whole art and science of medicine resolves itself into a question of symptoms and treatment. Typhoid fever means headache, cough, prostration, anorexia, furred tongue, peculiar temperature, dicrotic pulse, rales, rose spots, enlarged spleen, tympanites and possible intestinal hemorrhage or perforation, the patient to be treated by confinement to bed, fluid diet, cold tubs, intestinal antiseptics and, perhaps, appropriate surgery, while the flagellated bacillus of Eberth, with all the manifold pathologic sequences of its life and growth, oars its quick way through the oblivion of their disregard. And this is why, beginning with symptoms, I would turn next to a recitation of their excitants, the functional disturbances and organic lesions embraced under the term pathology.

3. *Pathology*.—Here we must begin to go backward. The difficulty most students find with morgue products, neatly ranged in pans, is that they are not connected with anything. Here is a consolidated lung; there an ulcerated intestine; beyond, a congested liver. But excepting a meager history and statement of disease terms on a pathologic department chart, there is nothing to

tell how the patient appeared before his "bagful of pe-tards" cast him forever out of his living semblance. The student wants to be reminded of the relation between the solidly-blocked vesicles, with their congested walls and roughened pleura, and the rapid, labored, painful, insufficient breathing of the patient, with his bright eyes, flushed cheeks and expanding nostrils. He needs to have recalled to him that the tremendous "nutmeg" liver and the dilated right heart gave to their unfortunate possessor, during life, an increased area of cardiac and hepatic dulness and a belly full of fluid and, perhaps, toward the end, bubbling, fluid rales over the lungs.

He desires, in fine, to be taught, so far as possible, to consider, in every case he sees, the relationship between clinical symptoms and pathologic conditions. But here is another chasm to be bridged. The student has forgotten by this time the appearance of the normal organ. Why? Because he was not sufficiently taught to compare it with the abnormal! Do not, therefore, fail to remind him of how the underlying conditions of these phenomena he beholds differ as certainly from the healthy ones as the physical appearances of health do from those of disease. Even with this the student may not stop. He must be taken further back, deeper in, before he can go forward. He must be taught to ask himself, if possible, to demonstrate to himself, the causes of these simple or complex differences, their etiology.

4. *Etiology*.—Here we get to the beginning of things, the accessories before the fact; and here, inevitably, we reach, in most cases, the limits of any certainty. Etiology is, very largely, the field of the investigator; the Delectable Land for those who sit already carelessly swinging among the higher branches. It is the playground of the scientific imagination and, therefore, not a safe place for the easily confused medical embryo to linger in. But he should be given at least a glimpse into it and be taught to look forward to the day when he may be worthy to share the labors of the wise men. Above all, he should be imbued with a profound distrust for the ancient idea that things "just happen," and be encouraged to embrace the modern theory that there is a reason for everything; and he should be gently but firmly led to remember that symptoms are interesting not merely as unexplained phenomena, but because they are the visible reminders of pathologic conditions, which in turn are referable to certain and actual causes, whether these be discoverable or not. He should learn to hold this, the great trinity, as inseparable: symptoms, pathology, etiology.

The student, thus informed of the logical steps in the study of disease, has all the letters of his code message at hand; which to translate he has but to turn to the key furnished him under the name of diagnosis.

5. *Diagnosis*.—This is a strong plank in the platform of many teachers, the subject of sounding phrases and well-rounded periods, and, therefore, need occupy here no further space than room for commendation of the growing practice of teachers to insist that the student shall be able to say not only why the symptom group, with its pathologic and etiologic indications, spells this disease, but also why it does not spell that or the other.

Symptomatology, pathology, and etiology seem to be concerned mainly with the faculty of observation; diagnosis with that of comparison and of judgment, and treatment with that of judgment and of action. Thus, logically, diagnosis and treatment overlap and are, in a certain sense, interdependent, for always the former should determine the latter, and often the latter does determine the former in practice. And thus diagnosis, the former of the two great divisions of medical science, leads us by an easy transition toward the latter. It is the beginning of the end, which is treatment. This easy transition, this turnstile between the deductive and inductive highways, has two handles, course and prognosis. These, like their greater brethren, are closely related, for upon

the known course of a disease which broadly includes its termination in recovery, disablement, or death depends our prognosis.

6. *Course*.—To a certain extent we can get the history of the progress of a disease from the books. But naturally we would rather get it from our teachers, especially if they embroider it becomingly with a description of its symptomatic and pathologic factors and their underlying causes, their waxing and their waning, in an epitome of what has happened and is to happen to the patient if his disease be left alone.

7. *Prognosis*.—This, too, we can in a way get for ourselves from the mortality tables, and the proportion of consideration given to it in the lectures is, naturally enough, in inverse ratio to that which the course occupies; but we would like to be reminded that prognosis often depends for its good or evil import upon the treatment selected and the time of its institution. And further, this ought to be impressed upon us which we find out later for ourselves, that to the peace of mind of our patient and his friends prognosis is of more importance than all the other ologies we have patiently digged among.

8. *Treatment*.—Under this heading our complaint shall be brief. We all recognize that if

" . . . conscience doth make cowards of us all ;
 . . . the native hue of resolution
 is sicklied o'er with the pale cast of thought ;
 and lacks the name of action . . . "

We all know that we cannot always have a diagnosis. We cannot always, with any degree of certainty, mentally formulate the pathologic picture before we exhibit the drug or perform the operation. But we are too apt to walk into the broad and easy path of empiricism if our teachers do not continually hold us back with some reminder that we are not to give nitroglycerin, for instance, because we have been told that it is good for heart disease, but rather because we have learned that it will dilate arteries and stimulate a sluggish heart; and then only after we have decided that the vessels need relaxing and the heart strengthening.

We should like to have pounded into us some such creed as this: "I believe in Observing, Comparing, Judging, and then Acting."

Insanity on the Increase.—The number of insane persons is increasing in New York, according to the annual report of the State Commission in Lunacy to the legislature. In 1892 there was one insane person to every 377 in the community. Now the ratio is 1 to every 299. A similar increase is reported to the lunacy commissioners of Great Britain. The commission finds some slight satisfaction from statistics, which show that the number of new cases last year was smaller than the year previous. There are 27,406 insane in the public and private institutions of the State, and 6,000 are being maintained in their homes. In the State institutions the net increase last year was only 499, the lowest in ten years. It cost the State \$4,593,477 to care for the insane last year, or an average weekly rate of \$3.49 per person. The State hospitals this year ask for \$2,000,000 for betterments, but the commission has cut this to \$1,500,000. The legislature is asked to appropriate \$4,950,000 for the care of the insane this year. The erection at the Utica, Hudson river, Binghamton, and Middletown State hospitals of four specially equipped buildings for the acute and curable insane is recommended. The commission expects that with the money available for betterments and additions to State hospitals the overcrowding of these institutions will cease before the end of this year. The system of paroling insane patients in the care of their friends is being gradually extended and special outdoor attention is being given to the tuberculous class of insane with marked results.

ORIGINAL ARTICLES

EXPERIMENTAL METHOD IN SANITARY SCIENCE AND SANITARY ADMINISTRATION.¹

BY

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The value of experimentation in all branches of inquiry is now generally recognized; its philosophic significance and its limitations are less often understood and appreciated. In the present paper I propose to show that there is no hard-and-fast line between the results of experiment and those of experience, and that in the field of sanitation, in which of necessity laboratory experiment is difficult when not impossible, the data of experience carefully studied and rigidly verified are capable of yielding results no less valuable than those derived in some other subjects by experiment.

To avoid confusion let us understand clearly at the outset exactly what we mean by the terms *experiment*, *experience*, and *observation*. Originally signifying much the same thing as experience, namely, both the processes and the results of trial or test, the word *experiment* has in recent times come to be used chiefly for a prearrangement, and an artificial arrangement, of conditions in such a way that specific questions shall be answered; while the term experience has come to be used most often to describe a result rather than a process—a result, moreover, obtained without prearrangement, and under natural or unpremeditated, rather than artificial or premeditated conditions. We speak, for example, of an *experiment* upon the strength of materials and an *experience* with a broken rail, or railway bridge. The term *observation* requires no special comment. Without this, both scientific experiments and scientific experience are worthless. *Verification* is, of course, the checking, controlling, or testing of the data and results of experiments or experiences, in order to determine their accuracy or degree of truth; and we are still indebted to George Henry Lewes for his striking exposition of the fundamental and indispensable function of verification in all sound and scientific inquiry.

Now a little reflection will show that experiment, in the somewhat narrow sense here laid down, is necessarily comparatively limited and very likely to be confined largely to the laboratory, for the reason that any prearrangement of conditions which shall be actual tests or trials of natural phenomena must oftenest be made under cover, in limited space, with comparatively few objects and at comparatively small cost. Hence, it has come to pass that the experimental sciences have been chiefly those which could be advantageously pursued in laboratories and workshops, and upon the small rather than the large scale. There can be little doubt that this fact has tended to magnify the importance of subjects or parts of subjects lending themselves readily to laboratory experimentation, and has served to draw off attention from, and thus to hinder the development of, other

sciences, or portions of sciences, quite as important as those capable of advancement by laboratory experimentation. In physics, for example, we may well suspect that materials at hand, such as air or water, and problems at hand, such as the behavior of bodies at various moderate temperatures, have received more study than their intrinsic importance requires, while remoter objects, such as the heavenly bodies, and very high and low temperatures, have not received the attention which they deserve. Doubtless the same fact holds in the biologic sciences, including physiology and medicine. Experiments upon the physiologic action of drugs have probably received, especially in the past, relatively too much attention, because of the ease with which they could be carried out; while the more difficult and more costly experiments, for example, those required to determine the purity of large bodies of water, such as rivers and lakes, or those upon the purification of sewage, have until recently received but little attention.

There is danger, moreover, that in the instinctive recognition of the difficulties of laboratory experiments upon large and difficult problems, investigators shall turn aside from the careful study and verification of the data and results of another class of experiments which, for the sake of differentiation, we may call natural rather than artificial experiments, and which in everyday language are described as experience. It is, for example, obviously unwise to regret our inability to test by the methods of ordinary artificial experiment the effects of polluted drinking water upon large communities, when there are frequently being exhibited, all about us, by such communities, natural experiments on a grand scale, the conditions of which can often be accurately determined, even after the fact, and the results of which are as capable of verification as are those of artificial experiments prearranged to answer specific questions.

When, in 1893, the city of Lawrence, Mass.—long in the habit of drinking the unpurified water of the polluted Merrimac river, into which, only nine miles above the intake of the Lawrence waterworks, the raw sewage of the city of Lowell was poured—set up between that water and its citizens a barrier of defense (a sand filter), permeable by water but impermeable by disease germs, an experiment was undertaken under conditions quite as clear and as favorable as those under which many laboratory experiments are conducted. The data at hand concerning this experiment—concerning its cause, inception, conduct, and consequences, were such as to enable those having the opportunity to study it to reach results, and to draw conclusions, of high accuracy, and even to predict with confidence the consequences of similar experiments elsewhere. This experience of a modern American municipality was also an experiment in the narrower sense—although not a laboratory experiment; for it was made artificially, and by prearrangement, in order to solve a specific problem, namely, to get rid of typhoid fever in a community in which that disease had long been, in the old phraseology, “endemic.”

One experiment often leads to another, and so also an experience often leads to experiment. Years before, in 1872, acting under the best engineering and scientific advice of the time, the city of Lawrence had introduced

¹ Address of the vice-president and chairman of Section K, American Association for the Advancement of Science, New Orleans, December, 1905.

for the benefit of its citizens a public water-supply drawn directly from the Merrimac river, nine miles below the mouths of the sewers of Lowell, as already stated above. In doing this there was no thought of making any scientific or sanitary experiment, but only of supplying the city with water for fire purposes and domestic convenience. Unwittingly, however, an important experiment was really being made by that municipality. As surely as if by premeditation and prearrangement a trial was being made, day by day, and year by year, of the effect upon the public health of the city of the use of a water-supply polluted with human excrements; and when, in 1890, typhoid fever appeared among the citizens to such an extent as to constitute a terrible epidemic, and to cause careful observation and study of the past as well as the present, it became evident that a most important experiment had been going on ever since 1872—quietly, naturally, and unobserved—and an experiment not merely dire in its consequences but rich in its sanitary teachings.

Careful studies of the various phases of this long-continued and tragically-ending experiment showed that the citizens of Lawrence had submitted themselves to, and participated in, conditions such as no premeditating experimenter in his wildest flights of fancy would have dreamed of proposing; for they had, for 20 years, been drinking the diluted excrements and other wastes of a large and dirty city. Further studies revealed the fact that so long as these excrements were unmixed with those of typhoid fever patients no excess of typhoid fever ordinarily appeared in Lawrence, but that if typhoid fever abounded in Lowell then, after the lapse of a period of time such as would be required for its transmission to the citizens of Lawrence, and for its usual incubation, typhoid fever invariably appeared in the lower city. In the end, this unpremeditated experiment proved to be remarkably instructive, for while Lawrence and Lowell were thus unconsciously experimenting, Haverhill, on the same river, a few miles below, and Nashua, a few miles above, experimenting with relatively pure water-supplies, suffered no excess of typhoid fever. These facts threw great light upon the cause of a constant excess of typhoid fever long characteristic of Lowell, and calmly accepted by the local physicians and sanitary officials as "endemic"—whatever that might mean—and regarded by them as unavoidable. For when the opportunity came to test their theory by a premeditated experiment, namely, the purification of the water, this "endemicity" of typhoid fever in Lawrence disappeared. It then became clear that the so-called "endemic," was really an epidemic condition, an epidemic condition characterized by the constant existence of a moderate number of cases, rather than the occasional existence of a great number, *i. e.*, by constancy rather than magnitude.

These simple facts will serve quite as well as any more extended discussion to establish the point which I desire especially to emphasize in this paper, namely, that the experimental method is not necessarily confined to laboratories, or applicable only to individuals. Some of its best examples and some of its richest fruits may be found in sanitation, as well as in physiology and

hygiene; in the environment as well as in the individual.¹

The practical importance of the recognition of these facts is very great. Comparatively few physicians or sanitarians are in a position to conduct artificial experiments of great importance, whether inside or outside the laboratory, but almost any wide awake observer, whether he be physician, physiologist, sanitarian, or engineer, may, if he will, find going on all about him natural experiments, the conditions of which may often be learned with great accuracy, even after the experiment is completed, and which may yield conclusions quite as capable of verification as are those of experiments made in the laboratory. This should be a matter of no small encouragement, especially for younger workers who, wherever they are, and whatever they may be doing, may safely rest assured that if they will bring to bear upon the experiments which nature is making all about them the same careful observation, generalization, and verification which they would apply to laboratory experiments, they are no less likely to reach results of the highest consequence, as well as to win the cordial appreciation of all competent scientists.

Many communities, moreover, are nowadays embarking upon new phases of water-supply, sewerage, and sewage-disposal, which, rightly considered, constitute veritable experiments in sanitary science and sanitary administration. And one of the most encouraging signs of the sanitary times is the custom, now universally approved and already widely adopted, of instituting elaborate and often extensive experiments before embarking upon costly and far-reaching improvements, the outcome of which would otherwise be doubtful or uncertain. The establishment by the State Board of Health of Massachusetts, in 1886, of a sanitary research laboratory and water and sewage experiment station on the shore of the Merrimac river, in Lawrence, marked the beginning of a new and important era in practical sanitation, because it was the introduction of the experimental method into a field of human activity, in which hitherto the results of natural experiments had been the chief guide. Imbued with the scientific spirit, and convinced of the importance of the experimental method in sanitary science, as demonstrated at the Lawrence Experiment Station where they were among the earliest workers, Messrs. Allen Hazen and George W. Fuller, now sanitary engineers of the first rank, caused the same methods to be invoked and applied before embarking upon the actual purification of the water-supplies of Pittsburg, Albany, Louisville, Cincinnati, and other cities with which they have had to deal. Still more recently, Mr. Fuller has planned and conducted, at an expense of \$50,000 or more, a series

¹ The author believes that a natural and serviceable distinction may be drawn between hygiene and sanitation, the former term being kept for those aspects of general hygiene or the public health affecting chiefly individuals or groups of individuals, the latter for those affecting chiefly environments. He has used this distinction with advantage for some two or three years past in his teaching and in his writing, *e. g.*, in the *Encyclopedia Americana*, Vol. xiv, article "Sanitary Science and Public Health," New York, 1904, and in a paper, "The Readjustment of Education and Research in Hygiene and Sanitation," in the forthcoming volume of *Proceedings of the American Public Health Association*.—*American Medicine*, Vol. xi, pp. 159-161.

of elaborate experiments in order to determine the best methods for the purification of the sewage of the city of Columbus, Ohio. The results of all these experiments are everywhere conceded to have been so valuable and instructive that well-advised municipalities today rightly hesitate to embark upon large and costly schemes of sanitation without first having made extensive experiments, locally conducted, bearing upon the solution of their own peculiar problems. It has been learned, moreover, both by experiment and experience, that the terms "water" and "sewage," which have so long been used in the abstract in sanitary science, when applied to concrete natural waters and municipal or manufacturing wastes, ought rather to be made plural, for the reason that the waters of various parts of the country and the sewages of different communities differ so widely, one from another, as to require widely different methods for their successful treatment.

In other forms of sanitary practice also, such as the drainage of marshes, the petzolizing of ponds or stocking them with fish, the experimental method has been usefully employed. Experiments upon the improvement of cows and cow-stables have given good results in cleaner and more normal milk. Experiments in street cleaning have shown that dirty streets are an evil, but not a necessary evil. Experiments in the separation and utilization of wastes have yielded results of sanitary and financial importance. Experiments like that of the city of Munich on the effect of sewerage upon the public health; experiments upon the cost and importance of systems of heating and ventilation; experiments upon the efficiency of copper sulfate as an algicide; experiments on the influence of pasteurized milk upon infant mortality—all these, and many more that might be given, testify to the value of the experimental method in sanitation. And yet, in most cases of this kind, we have to say, as Adams said of political experiments, "these can not be made in a laboratory or determined in a few hours."

There remains, however, one department of sanitation, viz., that of sanitary administration, in which the results of experience are more abundant than those of experimentation, results, too, which can not be regarded either with pride or satisfaction. I refer to the constitution and sanitary work of our various State and local boards of health. In some few cases these boards are well constituted, courageous, intelligent, and efficient. In a few cases they are even famous for their good work. In some other cases, although themselves incompetent, boards of health have had the good sense, or good fortune, to employ as their agents real experts, and to delegate to these their sanitary work. But experience shows that some State boards and many local boards of health in the United States are badly constituted, inefficient if not ignorant, and cowardly. The experiment has now been fully tried of appointing to such boards mere place-seekers and incompetents, with the natural results of poor public service and dangerous neglect of the sanitary interests of the people. It requires some knowledge, skill, courage and wisdom to administer the sanitary affairs of a modern community, and few indeed are the American cities or towns which have made

the experiment of organizing their boards or commissions of health to meet these requirements. Too often a hack politician or two, a second-rate doctor or two, and one or more vain or place-seeking nobodies—useless but not harmless—make up our local boards of health; and as no stream can rise higher than its source the services of such boards are disgracefully small in quantity and poor in quality. It requires no further use of the experimental method to predict from such direction or control of sanitary affairs, in further trials, dismal consequences.

Worst of all, this foolish and almost criminal experimenting is going on while we have today in America opportunities for some of the most interesting sanitary experiments that any scientist could desire. We are establishing model dairies, model municipal water filters, model sewage and garbage disposal-plants. Why can we not also experiment with a few model boards of health, which shall boldly set to work, and themselves make the experiment of trying to give to the city or town under their care the best possible sanitary (and I may add hygienic) conditions? Why can we not have more boards constituted like that of Montclair, N. J., of one or more leading physicians, one or more good civil engineers, and one or more good lawyers or business men? Why can we not have more boards experimenting upon the control of milk supplies, as are today the boards of Montclair, of New York, and of Boston? More boards studying experimentally the conditions required to secure proper heating and ventilation of public halls and public conveyances? More boards experimenting upon the suppression of the smoke nuisance, the dust nuisance, the noise nuisance? It is of comparatively little use to make good laws if no one will enforce or obey them, and improved methods of sanitation (and hygiene) are of small value unless intelligent, courageous, and energetic boards of health adopt and enforce them.

In Massachusetts the district medical examiner has displaced, with great advantage to all concerned, the aforesaid local coroner. And if, as there is much reason to suspect, local influences and prejudices make it almost everywhere difficult to secure able and aggressive local boards of health, then the experiment should be tried of having district, county, or State officials, authorized and willing to do the necessary sanitary work. The present plan is a failure, experimentally demonstrated; let us continue to invoke the experimental method in which we believe, and abandoning our present customs, which have been experimentally proved—for the thousandth time—to be hopeless, try something more promising. We cannot do much worse, we ought to do much better.

Study of Mental Disease at Cornell.—A class exclusively for patients afflicted with mental disease has been organized in the dispensary of the Cornell University Medical College. This department will be under the charge of Prof. Adolf Meyer. Hitherto there has been no such class in New York City, though there are many of the poor not sufficiently deranged to be committed to asylums who need more expert attention than can be given them at home. The new clinic will enable the student to observe in the early stages when mental disorders are most curable. Technically the clinic is known as the department of psychopathology.

A REVIEW OF RECENT OBSERVATIONS ON
TREPONEMA PALLIDUM OF SYPHILIS.

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The appearance of Siegel's report relative to the discovery of *Cytorrhycles luis* as the probable etiologic factor in the production of syphilis led the Imperial Board of Health of Berlin, Germany, to detail Schaudinn to investigate Siegel's claims, and, if possible, to furnish additional proof of this discovery. With this aim in view Schaudinn began his observations and discovered the organism which he named *Spirochæte pallida*, and which is now classified as *Treponema pallidum*.¹

Schaudinn, with the cooperation of Hoffmann, examined smears procured from initial lesions, secondary papules, the aspirated fluid of inguinal glands; he also studied cross sections of papules and of excised inguinal glands, and found *Treponema pallidum* in every case of uncomplicated syphilitic disease.

Schaudinn and Hoffmann found another organism in their researches which stained more deeply and differed in other ways from *Treponema pallidum*. For this second species Schaudinn proposed the name *Spirochæte refringens*. This form was not found in any case of uncomplicated syphilis, but the authors were able to demonstrate it in five cases of pointed condylomas.

Schaudinn describes *Treponema pallidum* as an extremely delicate, actively motile, faintly refractile, spiral, long, thread-like organism, tapering at both extremities and terminating in pointed ends. It propels itself, during life, by rotating around its longitudinal axis, first in one direction and then in another; in the resting state, undulating movements may be observed passing along the length of the organism, suggestive of an undulating membrane. In addition, bending, twisting, twining, and whipping movements of the whole body may be noticed. The organism varies from 4μ to 14μ in length, ranges in thickness from a size too minute for measurement to 0.25μ in the largest specimens. The spirals range from 6 to 14 in number; they are regular, narrow, and deep, corkscrew-like, and appear constantly so, no matter whether the specimen be derived from initial lesions, papules, lymphatic glands, spleen, etc., or from the scleroses of apes. Schaudinn did not observe a nucleus.

In a recent paper Schaudinn reports that he succeeded in demonstrating a long delicate flagellum at each end of *Treponema pallidum* with the aid of Löffler's method of staining for flagella. Later he was able to discern flagella with Giemsa stain also. In a number of

specimens he observed two flagella at one end, having the appearance of undergoing longitudinal division. He has failed thus far to discover any signs of an undulating membrane in a stained specimen.

Wechselmann and Löwenthal recently reported the discovery of a nucleus in quite a number of specimens of *Treponema pallidum* which they had examined with the aid of an ultramicroscope. It is their opinion that specimens of *Treponema pallidum* of 7μ or more in length, and presenting 6 to 8 spirals, are composed of two or more individuals lying end on end and overlapping each other.

Harvey and Bousfield report the finding of a definite chromatin granule which causes a bulging in the organism at the site of location, which is about one-third the total length of the organism from one end. The presence of this granule proved to be the rule rather than the exception.

Spirochæte refringens differs from *Treponema pallidum* by staining more deeply, by greater refractile power, and in the number of spirals. The spirals are less in number (3 to 12), appear flat, broad, and wave-like. The largest specimens of *Spirochæte refringens* attain a thickness of 0.50μ .

Schaudinn further states that Berdal and Bataille, 1891, reported "spirilli" in cases of balanoposthitis circinata. These authors inoculated syphilitics with the organisms and produced balanoposthitis. They were not found in other genital diseases, however. Csillag, 1898, reported these same spirilli in seven cases of balanoposthitis. He describes them as varying in length from 10μ to 20μ , with a diameter of 0.25μ to 0.50μ . They stained with 5% carbolic fuchsin. Rona recently reported that he had found spirilli occasionally in the smegma of healthy persons, in 10 out of 20 syphilitics in the initial lesion, and in 2 out of 11 cases of moist syphilitic papules. He found them almost constant in balanitis simplex and circinata; never in uncomplicated soft chancre. These parasites appear to be larger than those described by Schaudinn, and there is as yet no evident proof of any relationship.

Thesing criticizes Schaudinn's classification of *Treponema pallidum* and *Spirochæte refringens* as belonging to the protozoa. Since the appearance of his paper further evidence has been brought forward by other observers, which goes far toward substantiating Schaudinn's zoologic interpretation.

Metchnikoff stated in a lecture delivered before the Société des Hôpitaux de Paris, May 25, 1905, that *Treponema pallidum* was first seen by Bordet and Gengou, of Brussels, in a chancre and also in mucous patches. In January, 1905, Siegel, of Berlin, stained it, his result being confirmed by Schaudinn. Metchnikoff and Roux were able to demonstrate *Treponema pallidum* in unstained smears procured from the initial lesions of anthropoid apes which had been inoculated with the spirochætes. They employed chimpanzees (*Troglodytes*), *Macacus cynomolgus*, and one baboon (*Cynocephalus sphynx*) in their experiments.

Wechselmann and Löwenthal report that they, too, observed the organism in unstained specimens. They found it in all their preparations made from syphilitic

¹ The generic name *Spirochæte*, Cohn, 1872, simply represents an amended spelling of *Spirochæta*, Ehrenberg, 1834. Vuillemin (June 5, 1905) has taken *Spirochæta pallida* as type of a new genus *Spironema*, using the specific name *Spironema pallidum*, and Schaudinn (1905) has recently accepted this change in classification. As the name *Spironema* is preoccupied in zoology, it having been used by Meek in 1884 for a genus of mollusks, the present correct name of the parasite under the International Code is *Treponema pallidum*. Schaudinn's article proposing the name *Treponema* had not been seen by Stiles and Pfender when they proposed the name *Microspironema pallidum*.

tissues. In one instance they procured a smear from near the center of a chancre and found nine typical specimens of *Treponema pallidum* within the protoplasm of an unusually large cell. Further observations disclosed rod-like and sausage-shaped forms containing nuclei. The rod-like forms are $2.5\ \mu$ to $3\ \mu$ in length, very thin, about $0.25\ \mu$ in diameter, and pointed at the ends. They stain light blue with Giemsa stain and present from one to four reddish-violet nuclei, which apparently multiply by direct division. The sausage-shaped bodies are almost the same size, slightly thicker, with rounded extremities. They stain more deeply than the others and assume a bluish-red color. These bodies no doubt represent different stages of development in the life cycle of the spirochætes. They were found to be present in initial lesions, papules, inguinal glands, and blood taken from erythematous patches. These observers also discovered that shortly after the administration of mercury the long spirochætes would break up into separate short specimens, as already mentioned, and could then be found in large numbers, whereas the longer forms were to be found greatly diminished in quantity.

Ploeger observed short threads, one extremity of which ended in a blunt enlargement or knot; he also saw longer spirals which terminated in a point at one end, and were rounded or presented a bulbous enlargement at the other extremity. He observed stages of division, but was unable to determine whether these occurred in *S. refringens* or in *Treponema pallidum*.

Kraus and Prantschhoff made extensive observations at the Sero-therapeutic Institute, Vienna, and demonstrated the fact that *Treponema pallidum* is not to be found in healthy tissue of man and apes, nor is it found in pathologic tissues of nonsyphilitic diseases. Their examination of 24 cases of nonsyphilitic disease and 24 cadavers of nonsyphilitics resulted negatively, whereas in 50 out of a total of 62 syphilitics, the authors were able to demonstrate *T. pallidum*. In their experiments with monkeys (*Macacus rhesus*) they found that the initial lesion contained *T. pallidum* as constantly as does that of man, and that it is identical with the organism found in man, both morphologically and in staining properties. It will prove of interest to know that the spirochætes were found in monkeys in the initial lesion produced by direct transmission from man, and also in the lesion produced by inoculation of the organism from one ape to another.

Spitzer examined syphilitics in all stages of the disease and found *T. pallidum* in scleroses, initial lesions, secondary exanthems, erosions of mucous membrane in ulcerous forms, and in nonulcerative gummas. His examination of nonsyphilitics, cases of pemphigus, psoriasis, verruca plana, erythema nodosum, etc., resulted negatively.

Rille and Vockerodt examined in all 14 cases of syphilis at the dermatologic clinic at Leipzig, Germany, and found *T. pallidum* in every case. Of special clinical and parasitologic interest is their report of a case of tertiary syphilis. A female, aged 25, had acquired syphilis 7 to 9 years prior to date. Upon examination the authors found organisms resembling, and probably identical with *T. pallidum* and *S. refringens*.

Grouven and Fabry examined the tissues in 21 cases of syphilis and in suspected cases of syphilis. Their examinations resulted negatively in 6 cases, 2 of which gave positive evidence of syphilitic infection; in the other 15 cases they were able to demonstrate clearly the presence of *T. pallidum*.

Herxheimer and Hübner examined 17 cases of primary and secondary syphilis and found *T. pallidum* present in 16 cases.

Flexner and Noguchi report the examination of four cases of primary and secondary syphilis. They found the organism in 3 cases. In the fourth case they found what appeared to be *T. pallidum* in a fresh specimen, but they failed to find it in a stained preparation. Their examination of 2 nonsyphilitics resulted negatively.

Russell reports that he found *T. pallidum* in 2 cases of untreated secondary syphilis which had lately been under observation at the post hospital, Presidio, California. He used Wright's modification of Romanowsky's stain as it is used for malarial blood, except that he allowed it to remain on the slide for 24 hours at room temperature. His examination of 9 cases of syphilis which had been actively treated resulted negatively.

McWeeney observed nine cases of primary and secondary syphilis, and found *T. pallidum* in every case. He failed to demonstrate the organism in preparations made from a tertiary ulceration of the palate, also in a case of nonsyphilitic mucopurulent vaginitis.

Sobernheim and Tomaszewski report a series of observations which they made at the Hygienic Institute and Medical Clinic at Halle, a. S., Germany. They succeeded in demonstrating *T. pallidum* in 50 out of 58 cases of syphilis. The 8 cases, in which the examination resulted negatively, were of the tertiary form; 28 cases of nonsyphilitics which were examined resulted negatively throughout, in spite of long and carefully continued search for the organism. In the course of their observations the authors found that repeated examinations, day after day, were required in many cases before they succeeded in finding *Treponema pallidum*. In some cases which, from clinical and experimental observations are considered most infectious, they failed to find any spirochætes at first, or perhaps only a few, but on further examination the spirochætes would be found in large numbers, only to disappear again at an examination made at some future date.

Fränkel studied smears taken from six cases of primary and secondary syphilis, and found the organism in every instance. The examination of a case of condyloma acuminata resulted negatively.

Nöggerath and Stæhelin took 1 cc. of blood from the vein of the ear, diluted this with $\frac{1}{2}\%$ acetic acid, centrifugalized the mixture, made smear preparations, and stained them with Giemsa stain. They found *T. pallidum* in the sediment procured from syphilitics; examination of nonsyphilitics resulted negatively.

Scholtz examined initial lesions, condylomata lata, mucous patches, and papules of 33 syphilitics and found *T. pallidum* in every case. He also examined the tissues of 13 nonsyphilitics and found *Spirochaete refringens* in large numbers. He found *T. pallidum* in a case of

condylomata acuminata; the examination of the other 12 cases resulted negatively.

Flügel reports the examination of 29 cases of syphilis for *T. pallidum*, in which results were positive in all save 4 cases of tertiary form. Upon examining the pus taken from an affection of molluscum contagiosum in a syphilitic the author found *T. pallidum*.

Siebert examined a total of 125 cases at the dermatologic clinic of the University of Breslau, Germany. Seventy-three presented positive syphilitic infection, 6 were doubtful, and 46 comprised various skin affections. Seven of the luetic cases were in the tertiary stage, and in not one of these could *T. pallidum* be found. Of the remaining 66 cases of primary, secondary, and hereditary syphilis, the author was able to demonstrate *T. pallidum* in 52. In not one of these cases was it possible to demonstrate *T. pallidum* in the blood, although the local lesions contained numerous organisms. Examination of the 46 cases of nonsyphilitics resulted negatively.

Raubischek reports that he found *T. pallidum* in the blood of a female suffering with secondary syphilis.

Gordon examined 10 cases of cerebrospinal syphilis with tabes. Results were negative in 8 cases. In his study of 2 cases of syphilitic chancre of 12 days' and 4 weeks' duration respectively, he recognized organisms in the spinal fluid of the latter which resembled the organism *T. pallidum* described by Schaudinn. The other case resulted negatively.

Kiolemenoglou and von Cube not only found *Treponema pallidum* and *S. refringens* in their observations, but were able to recognize nontypical forms of spirochætes which could not be identified as either *T. pallidum* or *S. refringens* on account of their size and depth and breadth of spirals. Some of these forms were smaller than *T. pallidum*, presented two to three wavy spirals, but otherwise showed all the characteristics of *T. pallidum*. Others ranged intermediately between *S. refringens* and *T. pallidum*.

Von Babes and Panea examined the cadavers of three infants who died from congenital syphilis during or immediately after birth. *Treponema pallidum* was found in the blood, liver, spleen, conjunctival secretion, meninges, throat, lungs, kidneys, thymus, lymphatic glands, and suprarenal capsules. *T. pallidum* was found in every case to the exclusion of other microorganisms. The observations made by the authors on cadavers of infants who succumbed from causes not syphilitic resulted negatively.

Buschke and Fischer found *T. pallidum* in smears made from the liver and the spleen of an infant who had died from congenital syphilis 36 hours after birth. They examined the blood taken from the papules and lymphatic glands, but failed to find the organism.

Levaditi reports that he found *T. pallidum* in smears obtained from two infants with congenital syphilis.

Hoffmann examined the liver, the spleen, swollen inguinal glands, and vesicles of a child who had died from congenital syphilis 10 hours after birth and found *T. pallidum*.

Salmon reports a case of congenital syphilis which developed secondary papular eruptions several days after

birth. He examined the tissues and found the spirochætes.

Noubécourt, Levaditi, and Darré report a case of hereditary syphilis in a child who presented syphilitic eruptions predominating in the lower extremities. They made smears from a vesicle on the toe of the left foot and from the right side of the thorax. Examination showed *Treponema pallidum* in large numbers. The child died later and they made numerous smears from the liver, lungs, spleen and kidneys, also the bone marrow, but failed to find a single specimen of *Treponema pallidum*.

As is readily seen from the foregoing, the appearance of Schaudinn and Hoffmann's paper has led numerous other observers to investigate along the line indicated by these authors, and hundreds of observations have been reported in which *Treponema pallidum* has been found in cases of syphilis. Thus far, *Treponema pallidum* has been found in over 300 cases of syphilis, and not found in 62 cases examined. Most of the cases which resulted negatively were of tertiary form, while others were undergoing active treatment at the time of examination. In only one out of 138 cases of nonsyphilitic disease examined, was *Treponema pallidum* reported.

In view of the results of the experiments made on monkeys and anthropoid apes, the negative results in attempts to demonstrate *Treponema pallidum* in nonsyphilitic diseases, and the numerous positive observations on syphilitics, it is exceedingly difficult to escape the conclusion that *Treponema pallidum* is the organism which produces syphilis.

Since the discovery of the organism a number of stains have come into use, most of them purposed to improve the Giemsa stain by shortening the time required in preparing smears. Schaudinn and Hoffmann used Giemsa stain as follows: They allowed the cover-glass to remain in a freshly prepared mixture of 12 parts Giemsa eosin solution (2.5 cc. of a 5% eosin solution to 500 cc. of water), 3 parts of azur 1 (solution 1 to 1,000 water), 3 parts of azur 2 (0.8 to 1,000 water) for 16 to 24 hours. The preparations were then rinsed in water and mounted in cedar oil.

Giemsa's method: Prepare a solution of

Azur 2.	0.8 gr.
Azur 2. eosin	30 gr.
Glycerin (Merck chemically pure)	250.0 cc.
Methyl alcohol.	250.0 cc.

Dry the smear in air; fix with absolute alcohol for 15 to 20 minutes; dry with filter paper. Dilute stain (1 drop to 1 cc. of water); drop on smear immediately; allow to remain for 10 to 15 minutes; wash with running water, dry with filter paper; imbed in balsam and examine. This method will show *T. pallidum* in 15 minutes; the maximum stain is attained in an hour. Saprophytes will not grow in this stain on account of the combination of concentrated glycerin with methyl alcohol.

Levy-Bing's method: Marino stain. Dry smear in air; do not fix; stain with solution of azur blue .4 gr., methyl alcohol 50 cc., for about 10 minutes; remove cover-glass, and without washing the preparation or removing excess of stain, place cover-glass in an aqueous solution of eosin (20 to

1,000); allow to remain for 2 minutes; wash in water; dry, mount, examine. *Treponema pallidum* will appear stained an orange-rose color.

Davidsohn's method: Add to 100 cc. of water as much kresyl-violet as can be carried on a knife-point; filter. Fix smears; place them for a half to 40 hours (as desired) in the staining solution; wash in distilled water, or allow stain to drain off the cover-glass without washing; when dry, mount in balsam and examine. Davidsohn uses "Rextra" kresyl-violet manufactured by a Mühlheim firm.

Proca and Vasilescu's method: Fix for 30 minutes in alcohol; stain for 10 minutes with mixture containing phenic acid 50 parts, tannin 40 parts, water 100 parts, to which has been added basic fuchsin 2.5 gr. dissolved in 100 cc. of absolute alcohol; remove; wash in water; dry; stain for 5 minutes in a mixture composed of 10 cc. concentrated alcoholic solution of gentian-violet, 5 cc. of phenic acid, and 100 cc. distilled water; wash, dry; mount in Canada balsam and examine. The spirochaetes will appear stained a deep red, the preparation staining a pale violet color.

Rille and Vockerodt's method: Fix thin smears for 10 minutes in absolute alcohol, place in Giemsa stain diluted 10 times; allow to remain for four hours or longer. Wash in running water, dry, mount, and examine. *Treponema pallidum* will be sharply defined, and stained relatively dark.

Plöger's method: Place the dried smear, without fixing, in a solution of carbol-gentian-violet (10% concentrated gentian-violet solution, 2.5% carbolic acid solution) for one minute; wash in water, dry, mount, and examine. The pale lilac colored *Treponema pallidum* can be easily recognized with a magnification of 800 diameters.

Oppenheim and Sachs' method: Dry smears in air; do not fix; apply alcoholic solution of carbol-gentian-violet (5% aqueous carbolic solution 100 cc., concentrated alcoholic gentian-violet solution 10 cc.); heat over bunsen flame till steam begins to rise; wash in water, dry, mount in Canada balsam, and examine. *T. pallidum* is stained a distinct blue; *S. refringens* stains more deeply, is thicker, and presents its other characteristics. The diameter of *T. pallidum* will be found somewhat larger when this stain is used, on account of the absence of fixation which causes shrinkage of the protoplasm.

Reitmann's method: Make thin smear; dry in air; fix for 10 minutes in absolute alcohol; place in water for five minutes; transfer to a 2% phosphomolybdic acid solution; wash in distilled water and 70% alcohol; dip again in water and stain with carbol fuchsin till steam arises; wash in running water; dip in 70% alcohol; wash again in water till color is no longer given off; dry, mount, and examine. The nuclei will appear dark, the protoplasm light, serum very light; *T. pallidum* will appear stained a deep red, and more clearly defined than when stained with Giemsa stain.

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LITHOLAPAXY VS. LITHOTOMY.¹

BY

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To one reading any of the recent works on genito-urinary diseases it would seem that, in vesical calculus, litholapaxy is the operation of choice under certain well-indicated conditions, and that the question is a settled one. Now, as a matter of fact it is my belief that among American surgeons there are comparatively few who practise it. Not having perfected themselves in the technic of the operation, a suprapubic cystotomy seems the easier and safer operation, and there is no question that in unskilled hands the cutting operation is the safer. But I maintain that the skill necessary to perform a litholapaxy is easily acquired by one who has had practice in the use of urethral instruments.

There is no comparison in the after effects between the two operations; in the one the patient is able to go about his business in 48 hours, while in the other it takes practically six weeks for the wound to heal and another six weeks before he has gained strength enough to pursue his vocation.

Surgeons seem to fear the effects of injury to the bladder wall during the operation, and also the possi-

bility of leaving small particles of stone in the bladder, to act as nuclei for the formation of a new calculus later. In uncomplicated cases, with moderate care, injury to the bladder wall can be avoided, and the danger of leaving small particles in the bladder is, I believe, an overrated one, for even should such be left, they can be found and removed later by means of the cystoscope and evacuator. Stones recur after both the crushing and the cutting operations, and I do not believe they are any more prone to recur after a well-performed litholapaxy than after the cutting operation. On the other hand, the crushing operation may be repeated indefinitely. Can the same be said of the cutting operation?

In an uncomplicated case, with a stone of moderate size, the bladder uninfected, the kidneys intact, litholapaxy should be the operation of choice. When, however, there is marked cystitis or accompanying pyelitis, diverticulums or sacculations in the bladder, a trabeculated bladder, an encysted stone, or when for any reason the bladder needs prolonged drainage, undoubtedly the cutting operation is to be preferred. However, in the lighter forms of urinary infection we may expect to see the symptoms all clear up on removal of the stone by litholapaxy.

When stone is associated with prostatic hypertrophy, it may be removed by operation in conjunction with a suprapubic prostatectomy, or often a litholapaxy may be performed, leaving the patient, of course, in a condition in which a recurrence may readily take place, so that such a patient requires rather careful watching that the bladder may be kept clear of calculous formation. More often these calculi, especially those of recurrence, are apt to be phosphatic in character, and for this reason are rather readily removed. As these patients are apt to be elderly and enfeebled, and a general anesthesia is best avoided, Dr. Chismore, of San Francisco, some years ago reported a number of cases in which cocain was used in a series of short sittings, often at his office. He injected about 2 ounces of a 4% solution of cocain into the bladder and, introducing the lithotrite, would crush as much as possible in a short space of time, then wash out the fragments with the evacuator, as much as would come away, then wash the bladder with an antiseptic solution, leaving the larger fragments to be removed at a later sitting, usually allowing a week to intervene for the resulting soreness to wear off. These patients were not kept in bed, but were allowed to go about their ordinary vocation.

When patients with stone present themselves, it seems best to study them for a while, at the same time getting them in condition for the operation. The discovery is generally made in the course of a systematic examination of the urinary tract. This should always be conducted under strict asepsis, washing out the bladder after the examination and then injecting and leaving in the bladder some unirritating antiseptic. I also prescribe some internal urinary antiseptic, to be taken up to the time of operation, continuing it for a week or more after the operation, according to indications. During the period previous to operation it is of great assistance to make a complete examination of the patient's general condition.

When possible, the cystoscope is of the greatest assist-

¹ Read before the Virginia State Medical Society, annual meeting, at Norfolk, October 24-27, 1905.

ance, and I have used it in almost every case. With it, we can learn the condition of the bladder wall and something of the size and character of the calculus, the position it usually takes in the bladder, and whether more than one are present. Another maneuver which I have found of assistance is to examine with the lithotrite, first cocaineizing the urethra and, after washing out the bladder and leaving therein 6 to 8 ounces of a saline or boric acid solution, then gently introducing the lithotrite, the patient lying upon the operation table with hips raised, in the position for performing the operation, in order to see how readily or with what difficulty the stone can be seized.

The instrument which I have come to prefer is a medium-sized Keyes lithotrite, which seems to be large enough for a good-sized stone, and I find I can do quicker work with it than with a smaller-sized instrument. For an evacuator I prefer the Chismore, which is simple in construction, effective in execution, reasonable in price and readily replaced when worn out, and easily sterilized. All the instruments, the hands of the operator and the field of operation, should be rendered as sterile and aseptic as possible, and it is a good plan to have the patient shaved and ready, should it become necessary for any reason to perform a suprapubic or other cutting operation.

The majority of my patients have been operated upon under general anesthesia, which I prefer, if feasible. With the patient on the operating table, the extremities covered, the hips raised, the urethra may be washed out and a catheter inserted, and after washing out the bladder, I leave in it four to six ounces of a warm boric acid solution, and withdraw the catheter. The lithotrite, smeared with sterile white vaselin as a lubricant, is inserted slowly and gently and then held in position, the handle of the instrument slightly raised, the point of the beak directed upward, the under surface is gently pressed down upon the dependent bladder wall to form a sort of pocket or groove, the male blade is slowly opened to its widest extent or as wide as may be found necessary, then slowly closed. In the majority of cases it will close upon the stone which, if movable, will slowly settle down into the jaws of the instrument. When caught, the blades are locked and the screw slowly and firmly turned until the stone is fractured, and the blades are completely closed before reopening them. The other fragments are then successively caught and fractured in the same manner and this is continued until no large fragments can be found. The best method of performance is, when the stone is broken up into pieces small enough for it all to pass through the evacuator with only one insertion of the lithotrite, and not jump quickly from lithotrite to evacuator and back again to lithotrite. However, the stone is not always to be caught in this simple manner, it may not fall into the jaws of the instrument, and the jaws close without catching it. In this case you have to keep the jaws closed and rotate the instrument somewhat after the manner of the searcher to find in what portion of the bladder the stone has settled. It will be found after this in the course of the operation that most of the fragments of the fractured stone

seek this spot and can only be caught by rotating the beak to this point. To catch the stone in the first instance, rotate the closed beak in the direction in which the stone is found to lie until the beak rests upon it, open the blades, rotate toward the stone and close the blades upon it, lock the blades, and before using the screw, rotate the instrument to see that no portion of the bladder wall has been caught. Cases like this will prolong the operation and require greater skill and patience to bring to a successful issue. For when, as in the first instance, the stone is quickly caught, it can be readily and quite quickly reduced to fragments, unless very large, by simply holding the instrument still in the first position and opening and closing the male blade upon the female blade as a fixed point. After reducing the fragments as much as possible, the lithotrite is removed and the lubricated evacuating tube introduced until the flow from the instrument, quickly stopped by the thumb, shows that the eye is in the bladder. The evacuators (I always use two and keep a third in readiness) should be ready filled and kept in a large vessel full of a warm sterile boric acid solution, one large enough to hold readily both evacuators and to enable an assistant to fill by plunging the instrument and both hands into the fluid. The evacuator is fitted to the tube and the bulb alternately, slowly compressed and quickly released, until the bottle is full or the click of the swishing fragments ceases. The evacuators can be used alternately without removing the evacuating tube, an assistant emptying and refilling one while the operator is using the other. The beak of the tube should be pointed in different directions to find at which point the fragments most readily pass through it. If the click continues after fragments cease to fall into the bottle, of course those remaining are too large to pass through, and the lithotrite has to be reinserted.

The operation generally lasts one-half to three-quarters of an hour, though the actual crushing may often only last ten minutes. Manipulations should be slow and deliberate, but no time should be wasted.

After the operation the patient is put to bed for 24 to 48 hours. Sometimes it is necessary to use the catheter at the time of the next urination on account of retention; I think I have only done this once. Usually after 24 hours the patient may sit up, and he may go out the next day. Sometimes daily treatment of the bladder is necessary, but usually not. After the first week or at the end of the second I examine the bladder with the cystoscope (usually under cocain), or I may use the evacuator to see whether any fragments can be brought away.

I will report a few cases which I think are not without interest.

CASE I.—This case I reported in the *Journal of Cutaneous and Genitourinary Diseases*, April, 1902, under the title "A Case of Litholapaxy Under Cocain." This case—that of a man of 62—was of interest because the urethra was very tolerant to instrumentation, and I concluded that the calculus could be removed under cocain. Before resorting to the operation I treated the bladder for a month, and twice a week practised with the lithotrite and the evacuator in order that the patient might become used to the instruments. The first time I passed

the lithotrite and caught the calculus in its jaws. On rotating the instrument I discovered that there was another calculus present.

At the first operation only one calculus was removed, as the effects of the cocain had worn off before the second one could be attacked, so this was left for a second operation. At the second operation, a month later, the remaining calculus was entirely removed with the lithotrite and evacuator under cocain. Within a week after this operation the urine had become perfectly clear, the intervals of urination normal, and the patient was entirely relieved of all pain.

Three months later he returned with cloudy urine, pain on urination and frequency. The searcher revealed nothing, but the evacuator brought away a small uric-acid calculus weighing 2 grains. The fact that three months had passed without symptoms, and in view of this patient's subsequent history, I feel convinced that this was due to new calculous formation and not to particles left behind at the time of operation.

The following March the patient again presented himself, having for two weeks had a return of his frequency every hour during the day and every three hours at night, but there was absolutely no pain, and the urine as passed in my presence was clear. The searcher again revealed nothing, but the evacuating bottle brought away numerous grains of uric-acid sand. It was perfectly evident to my mind that the man was secreting uric-acid crystals which form from time to time; and had a cutting operation been done, he would again have had a recurrence of stone. As it was, he could have been kept free from the formation of calculi by having the evacuator used at stated intervals. Had lithotomy been performed, these washings would still have to be done in order to prevent their formation.

At this time he had no prostatic enlargement and no residual urine, as I had repeatedly examined him to make sure of this point. I did not, however, see this patient again until two years later, February, 1904. When he presented himself, he declared emphatically that he had had no symptoms of any kind until the day before, when he had pain in urination and noticed blood in the urine. I can hardly credit this statement of the patient, though I can believe that, though he must have had some signs, they did not disturb him sufficiently to make him seek relief. He must have had bad symptoms which should have brought him earlier, for on examination with the searcher I found quite a large calculus.

Thinking that I knew his bladder so well, I appointed the following day for a litholapaxy under cocain as before, but on attempting the operation I found it was not so easy to engage the stone, and after it was caught and fractured I had to search for the pieces, and always found them by rotating the beak to the left side of the bladder. This took time, so that before all the stone was crushed the effects of the cocain had worn off and the patient became restive. So I introduced the evacuator and washed out what I could, but two or three fragments were left behind which were too large to pass through the tube. That, however, was of no moment, and I completed the operation a week later again under cocain. The fragments were again found to the left of the bladder as before, and it was at this point that I made a serious error in technic. After using the evacuator, one fragment too large to pass was still left, and I did not notice that I had almost emptied the bladder before introducing the lithotrite for the last time, so that after its introduction, on opening the blades, a bit of the mucous membrane at the neck of the bladder slipped between the blades in such a way that I could not disengage it, and there was nothing to do but remove the instrument with a small bit of the mucous membrane clinging to the jaws. It was a simple matter to put some water in the bladder, when the fragment was quickly caught, crushed, and evacuated.

This accident would have been avoided had I prac-

tised the same manipulation on the patient already described, and used the cystoscope to note the position of the stone and also to note the fact that he had begun to develop prostatic hypertrophy with residual urine.

The immediate effects of the operation were good, but the urine never cleared, and some time after the operation the patient complained of great frequency at night, with nagging pain referred to the neck of the bladder. Local treatment was of no avail, the cystoscope revealed nothing, there were only 2 oz. of residual urine. The patient will not consider an operation for drainage of the bladder, though he still comes occasionally for treatment.

CASE II.—This patient, a man aged 33, came to the dispensary in the spring of 1902. He had frequency of urination, and pain at the end of the act; urine cloudy. No venereal history. I first suspected tuberculosis of the genitourinary tract. With the finger in the rectum, after the bladder was empty, I felt what I thought was a large, smooth prostate. Upon making pressure with the finger, the upper half of what was apparently the prostate disappeared, leaving a prostate of normal size. I at once suspected stone and the searcher revealed it without trouble. Thinking that I had to deal with a pocket behind the prostate which the stone might have made for itself or have formed because there was a pocket there, I used the cystoscope and found a perfectly normal bladder, and that there was no pocket, the stone being readily moved about the bladder with the beak of the cystoscope. This phenomenon of the stone wedged behind the prostate at the end of urination I found on three successive rectal examinations. Litholapaxy was easily done under chloroform at the patient's home in an East Side tenement, patient being up and about two days after the operation.

CASE III.—The patient came to the dispensary in February, 1904. He was a large, rather stout, but powerfully built man, aged 73. He had suffered from stone for five years. Two years before coming to me he had refused operation, but now his sufferings were so great that he came to see what could be done to relieve him. He was urinating every 10 to 15 minutes, day and night; he would have a severe spasm of the bladder at the end of the act which caused such great pain that he often cried out. He was so nervous that the examination was made with great difficulty, and while stone was readily discovered with the searcher, it was impossible to note anything in regard to it. He begged not to have an operation, but after a few days, seeing that local treatment did no good whatever, he agreed to enter St. Mark's Hospital to see what could be done for him, on the understanding that I was to do whatever operation I thought best. I agreed to try litholapaxy, if possible; if not, a suprapubic operation was to be done. He was prepared as for that operation.

Anesthesia was started with chloroform, but changed to ether. Even under profound anesthesia the bladder could be made out to hold not over 2 ounces, and the stone was found wedged above the symphysis and could not be made to engage in the jaws of the lithotrite; so without losing any time I proceeded to do a suprapubic operation, assisted by the house staff. On opening the bladder the stone came into view, and was so turned that its narrower end presented, and upon its removal a second stone was found. They were both strongly faceted, having long been in contact. The larger one was found to have been too large in its long diameter for the lithotrite, and I consider it fortunate that I did not first catch the smaller one. The two, when freshly removed from the bladder, weighed 4½ ounces, but now weigh, when dry, 3½ ounces. The bladder was sutured over two drainage-tubes according to the Gibson method, one shut with an artery clamp and the other carried to a vessel filled with an antiseptic fluid.

He remained in the hospital six weeks, and it was another six weeks before he had gained strength enough

to go about. Last week he came to the dispensary in answer to my note asking his condition. His urine was clear and he declared himself to be in perfect health.

CASE IV.—This patient was sent to me in July, 1904, by one of my assistants, Dr. S. J. Liebman. He was nearly 70, and had an enormous hydrocele which interfered in no small degree with the examination of the bladder with a searcher. He had had his symptoms for about a year, urination about every hour by day and every two hours at night. He wanted me to do a litholapaxy, if possible. This was done a week later under chloroform, the hydrocele being tapped first, when manipulation with the instruments was much easier, the whole operation occupying about half an hour. An interesting observation in this case was that there was absolutely no relief of symptoms after the operation, and treatment of the bladder made no impression on them. He was very nervous and could not sleep well. Finally he gave up all treatment and after a few weeks Dr. Liebman told me the patient had completely recovered. His urine became clear, the intervals of urination normal and his health completely regained. This phenomenon I cannot explain. No fragments were left, for I examined him with the evacuator on two different occasions.

CASE V.—The patient was a boy of 17. When he was 9 years old he had an attack of renal colic. For the previous six weeks before coming to me he had frequency of urination and had to give up work. The searcher revealed a stone. The cystoscope showed it to be a small one, and the bladder was healthy. This case is interesting for the following reasons: First, the difficulty of catching the stone with the lithotrite. I think it was 15 minutes before I was able to grip the stone with the jaws of the instrument, but after the first seizure and fracture the rest of the fragments were readily reduced. Second, the fact that at no time were the washings in the evacuators even blood tinged. The boy left the hospital in 48 hours. Two weeks later I examined him with the cystoscope to see that all fragments had been removed. Dr. J. T. Gwathmey gave the anesthetic.

CASE VI.—About a month ago Dr. Samuel Spiegel asked whether I would consent to do a litholapaxy on a young woman who had stone in the bladder. He said she was an imbecile, aged 30, living at home with her parents. She had had her symptoms for four months and had been in the hands of many doctors, none of whom had made a diagnosis of stone. He had just seen the patient and wanted me to perform the operation the following morning. I suspected that this would be a case of a calculus formed about a foreign body, and while doubtful about the practicability of doing a litholapaxy, I agreed to see the patient with him and make an examination under chloroform. The patient was placed on a padded kitchen table. Dr. Kleinman gave the anesthetic. Examination by the vagina showed a hard substance in the bladder, rounded and the size of an egg. Anteriorly running from the stone to a point above the symphysis could be felt a firm substance which felt the size of a slate pencil which I said would probably turn out to be either a slate-pencil or a hairpin. The urine was foul, like thin pea soup. The bladder even under anesthesia would not hold more than an ounce of fluid; if more were injected, it would become ejected immediately. The stone I believed would be soft and phosphatic, so I introduced the lithotrite, readily caught it and quickly reduced it to fragments. In using the evacuator, many of the fragments were lost by being forced through the urethra alongside the tube, and on releasing the pressure on the bulb air would be sucked into the bladder and then into the evacuator, interfering with the working of the instrument. After the crushing was completed, the hairpin, for such it proved to be, could be felt through the anterior vaginal wall. Dr. Spiegel suggested dilating the urethra with the finger (it had already been well dilated by instrumentation) and trying to reach the object by the urethra. As his finger was

more slender than mine, I asked him to see what he could do. In a few moments he was able to reach the sharp points of the object with the tip of the index finger and bring them to the urethral opening and with the other hand above the pubes it was brought further into the urethra and grasped with a pair of artery clamps and withdrawn. It was found to be a hairpin incrustated with phosphatic material. Dr. Spiegel was afraid that the fragments of stone still left would form the nucleus of another stone, but I believed differently, and while we washed out the bladder as well as we could, some grains were left behind at my suggestion, as I believed it was of utmost importance to shorten the operation. A few days ago Dr. Spiegel reported that the patient was entirely well and the urine, which at the time of the operation was very thick and foul, was now absolutely clear and the patient without symptoms.

THE OUTLOOK FOR THE CHRONIC DYSPEPTIC.¹

BY

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Let me begin with the assertion that the outlook for the chronic dyspeptic is very bright. This article is intended to be a review of my former works, together with some slight additions concerning intestinal disorders.²

Chronic dyspepsia is caused by either organacidia gastrica, organacidia enterica, or by insufficiencia pylori,³ or by a combination of these.

In dealing with diseases of the alimentary canal we must ever be conscious of the following facts: The alimentary canal is actuated and influenced in both its physiologic and pathologic functions by the laws of physics and chemistry. Next most important is to consider the nature of the peristalsis. In order to understand clearly the physiologic and pathologic conditions of the gastrointestinal canal we must be thoroughly conversant with the following facts: The gastrointestinal canal is a highly elastic tube, in parts firmly attached to other structures, and in other parts freely movable; this tube nearly always contains fluids and gases, which are either ingested or produced during digestion, and these fluids and gases in no wise form exceptions, but are always subject to the laws of chemistry and physics, such as gravity, expansibility, and chemical irritability. Further, we must never forget that the alimentary canal is adjacent to and in direct contact with all other viscera of the body. Even the lower extremities are often directly influenced by the pressure of the distended intestines upon the lumbar and sacral plexuses. Considering the relation of the alimentary canal to other viscera, beginning with the thorax, we find here the esophagus is in direct contact with the large vessels and the lungs. In the abdomen the stomach is in direct contact with the

¹ Read by invitation before the Brooklyn Medical Association, November 8, 1905.

² For the more exhaustive description of symptoms, diagnosis, and treatment, I beg to refer the readers to my original articles in *American Medicine*, March 22, 1902; *Philadelphia Medical Journal*, May 24, 1902; *New York Medical Journal*, October 4, 1902; *Journal American Medical Association*, April 16, 1904; *Medical Record*, April 30, 1904; *Medical Record*, September 6, 1902; *American Medicine*, January 10, 1903; *Philadelphia Medical Journal*, March 28, 1903; *Medical News*, March 28, 1903, and *American Medicine*, May 7, 1904.

³ See *American Medicine*, Vol. v, No. 14, p. 548.

liver, pancreas, and diaphragm and through the latter with the heart and left lung. The convolutions of the intestines appose every other organ, including the female organs of generation, and all vessels and nerves situated or arising within the abdominal cavity. Let us now picture to ourselves the condition of gaseous distention, which exerts equable pressure upon all other structures with which the alimentary canal is in apposition and we shall understand why a dyspeptic who passes large quantities of gas both ways has palpitation, painful breathing, especially and mostly on the left side; why he has intercostal neuralgia, pleurodynia, pain between the shoulders, pain in the loins; why he coughs, why he is cyanotic. How often do we witness the disappearance of cyanosis with the disappearance of meteorism? I wish especially to dwell on gas distention of the alimentary canal and its effects upon the heart and lungs. Several patients with asthma who came to me not for the cure of asthma, but to bring their digestion into a better condition, showed a surprising improvement in their asthma within eight days, and in some in even less time; gas distention was present in these cases to a marked degree.

The common "nervous" dyspepsia is due to the presence within the stomach of organic acids to an abnormally large degree. Authors still hold the fallacious view that there is either little or no organic acids in the stomach, that organic acids cannot coexist with free HCl, and that the free HCl acts as a disinfectant. These views are unequivocally wrong. The presence of free HCl by no means precludes or excludes the presence of free organic acids, nor does the presence of good quantities of free HCl exclude the presence and growth of microorganisms. In fact I grew microorganisms in free HCl solutions of a strength normal in the stomach. Free HCl and free organic acids coexist in the stomach in variable proportions. At one time the HCl preponderates, at another the organic acids are in greater evidence. In one case there are no organic acids, in another there is absence of free HCl; but each fact must be absolutely ascertained and all possible sources of error left out.

We have been trained to designate as "nervous" conditions in which we find no pathologicoanatomic evidence. In diseases of digestion we have to deal chiefly with the problems of pure chemistry, and when this is fully realized we shall see the futility of attempting to gauge abnormal conditions of digestion by any other than chemical standards.

Organacidia gastrica is a disease, the most prevalent disease of the stomach from which even the suckling infant is not exempt. It is mostly a disease of the young, although no age can be excepted. It is also this disease which gives the craving for alcohol, which makes drunkards. It cannot be denied that alcohol is a good remedy in this condition, as it converts the burning, irritating, organic acids into the corresponding esters, which very soon manifest their good effect. Unfortunately, the remedy is worse than the disease. Organacidia gastrica and organacidia enterica are as much the cause of alcoholism as is pain the cause of morphinism.

I have differentiated three subdivisions of organacidia gastrica, namely, organacidia gastrica simplex, gas-

trosia fungosa, and zymosia gastrica. The first variety is usually the acute form, the latter two are of a chronic nature. Organacidia gastrica simplex has its symptom-complex produced by the ingestion of large quantities of organic acids, either as such or in fruits or salads. Gastrosia fungosa is that condition of the stomach also accompanied by relatively large quantities of organic acids, which are the result of mold growth in the stomach. I speak of relatively large quantities of organic acids, *i. e.*, the relation of the organic acids to the free HCl. An acidity of 20 organic acids may be both high and insignificant. It may be disregarded when there is free HCl of 40 or more, but it at once becomes pathologic when there is no free HCl. I shall not dwell too long on this subject, but will only state that large membranous patches of mold are very often aspirated from the stomach. Since mold as such is very seldom eaten, it stands to reason the large patches could only be the result of growth within our bodies and developed from ingested spores. The difference between spores and large patches represents growth, and therefore the essentials of growth and consequently chemical changes. Growth at once and imperatively implies assimilation, absorption, and elimination, which processes cannot have any other but a deleterious effect upon our bodies. The varieties of mold I have seen mostly are either green or dark red. I have found that the patches belong to the green variety, and that the red mold appears in the fibrillar form. This latter variety is accompanied by severer cerebral symptoms. These two colors must be borne in mind, for otherwise they may readily be confounded with "bile and blood."

In zymosia gastrica the suffering of the patient is caused by chemical changes attendant and necessary to the growth of the yeast. In this condition a multitude of sporulating budding yeasts are seen under the microscope in a specimen of the aspirated stomach contents. Budding, sporulating yeast is not normal in the chyme. Either of these conditions, gastrosia fungosa or zymosia gastrica may exist by itself or both may be present in combination. There is another cause for organacidia gastrica which I have not mentioned; this is the ingestion of an excess of starchy matter, "organacidia gastrica ab amylo." Starches, as we know, are converted into saccharids by either diastase or pancreatin and the conversion of the saccharids into acids is a very natural chemical sequence. An excessive quantity of starch is eaten by the poor from necessity mostly in the form of potatoes and cheap breadstuffs. Starch in excess is eaten by the rich from choice in the shape of cakes, pies, and other pastry. In both social extremes the excess of starch ingestion produces an excess of organic acids. To cure his faint feeling, his weakness, his pains, one of the lower social class instinctively takes the lowest form of alcohol, while on the other hand the upper class indulges in cordials. The resulting good effect of alcohol upon the irritating volatile acids which are converted into the esters is known to all and alcohol after meals is looked upon as aiding digestion. However, this theory has been proved absolutely wrong in my experiments; the alcohol does not help the digestion, but it does stop the irritation of the stomach by

changing the irritating acids into the corresponding esters.

The organic acid of *gastrosia fungosa* is succinic acid; the acids of *zymosia gastrica* are acetic and butyric acids. These acids are volatile, gaseous, and like other gases have the property of expanding and permeating everywhere. These acids are also irritating and cause soreness, rawness, or pain in organs the mucous membrane of which they come in contact. The degree of pain depends upon the degree of irritation, upon the concentration of the acids and on the length of time the mucous membrane has been exposed to the deleterious action of these acrid acids. If the cardia offers sufficient resistance and checks the noxious gases the damage will be confined to the stomach. But if the organic acids have free escape into the esophagus and pharynx, not only will these structures suffer the consequences of the contact of their mucous membrane with the acids mentioned but also the structures with which the pharynx communicates—the ear through the eustachian tube; the nose through the posterior nares; and from the nose, the conjunctiva through the lachrymal canals; and the forehead and the frontal cells through the communication with the infundibulum of the ethmoid bone. It is nothing new to ophthalmology, laryngology, rhinology and otology to call the aid of the stomach in treating the respective organs. And often the stomach alone is relied upon to effect the cure. Organic acids irritate the mucous membrane of any and every organ. Irritation of the mucous membrane of any structure means contraction of the muscularis to which the irritated mucosa is attached. The force and the duration of the contraction is in direct relation to the strength and duration of the irritant and the contractility of the muscularis. The strong contraction of the stomach shoots out its contents as vomit; regurgitation of sour stuff indicates contraction of a less violent nature; waterbrash is also the result of gastric contraction due to irritation.

A very frequent cause of chronic dyspepsia is insufficiencia pylori. It is this disease which baffles the physician, as it gives no symptoms. The insufficiencia pylori I speak of here is the sequel of chronic pyloritis.

I designate as insufficiencia pylori that condition of the stomach in which one hour after the ingestion of an Ewald's test-breakfast either no contents at all or but 1 cc. or 2 cc. are aspirated from the stomach. If such little quantity of chyme is aspirated, it is found to be very coarse and imbedded in mucus, hence the reaction is either neutral or alkaline, occasionally slightly acid. Such a condition has been described by Einhorn as *achylia gastrica*, which was also my diagnosis at first. But pondering over the question and searching for the condition of the stomach at an earlier time than one hour after the eating of the test-breakfast, I obtained results which made me change my views regarding the correctness of the diagnosis of *achylia gastrica*. *Achylia gastrica*, with the presumption of its being of nervous origin, defies attempts at cure, but the same clinical picture interpreted as insufficiencia pylori makes the prognosis one of the brightest. Grave as the symptoms at times appear, often simulating cancer, the patients make a rapid recovery. For illustration: I was

called in consultation to a middle-aged man, a cigar-maker, who had been sick for several weeks. He had severe pains, lost flesh, vomited. There was an uncertain hue to the color of his skin. The attending physician thought it was a case of cancer and so his predecessors also had thought. To the amazement of all present, I assured the patient that he would be well in three or four days. The patient went to work the following week and remained well.

Improvement sets in very rapidly and cure is usually accomplished in about three months, which is quick indeed for one who has suffered for years. The trouble is the patient gets well too quickly. By this I mean when a patient who has suffered for many years and who, in order to avoid suffering, has had to live on a starvation diet finds cessation or very marked lessening of his agonies soon after he begins treatment, often within less than 36 hours, he is very apt to start out on a tour of investigation and experimentation. He wants to try to find out, and soon eats of forbidden food. I will cite an instance: A gentleman in the fifties, the clerk of a county about 400 miles from New York, was sent to me by his physician. Briefly, his history was that he had suffered for many years, that several years ago he went abroad with his physician, that he came back without the relief sought, that to improve his health he went west; but he was not helped. Especially the eating of meat gave him severe pain that kept up for several days. He stayed in New York for treatment for 10 days, visiting me each day. Two days before he left he went in company with some friends to a fashionable restaurant for dinner and afterward boasted to me that he had "cleared off every plate." He was very happy to be able to say that the meat he so dreaded before had borne no ill effects.

Insufficiencia pylori is produced by the gradual weakening of the pyloric sphincter, which is the result no doubt of a previously stenotic and inflamed condition of the pylorus. Complete insufficiencia pylori is not of a spontaneous, sudden appearance. At first the pylorus has still some power left, and, while it may not be able to keep the test-breakfast for fully an hour, it will show sufficient force to keep the ingested matter for say a half hour. Or the pylorus may be weakened and retain the ingested food during a shorter time. All these facts must be made sure of beyond any doubt, for we must absolutely know how soon after meals the drugs are to be given. Therefore, several examinations are necessary. If there are no contents even 15 minutes after the eating, the absence of all digestive functions cannot yet be assumed positively. In such cases I give the patients the test-breakfast and immediately after eating have him lie down on his back, perhaps slightly turned to his left. In this way I could find digestive secretions which I could not find before.

The third cause of chronic dyspepsia is organacidia enterica. I intend to make the description of this disease, the commonest of all enteric diseases, the subject of a special treatise and shall now go over only the most important points. Like organacidia gastrica, organacidia enterica is a generic term and is capable of the following subdivisions: Acute organacidia enterica, acute enterosia

fungosa, chronic organacidia enterica, and chronic membranous enterosia fungosa. The first is due to the ingestion of organic acids in fruits or acids, which acids have already passed the stomach and are now manifesting their presence in the intestine. The symptoms of this condition are most violent and are very well known to us as severe colic or as acute dyspepsia—the severest pains, the severest chills, the highest temperature—but if properly understood and treated, all these symptoms disappear in a few hours. Acute enterosia fungosa is especially a disease of infancy and is characterized by the copious evacuation of green stools. Like the green vomit, these green stools are supposed to owe their color to bile pigment. But the fact is that these green masses are masses of fully developed vegetable life. The ingested or inhaled spores ripen in the excellent culture medium of the infantile intestine into the full plant. The chemical changes consequent upon this growth irritate the intestine into increased peristalsis, which is the cause of the emptying of the intestines.

Chronic organacidia enterica is one of the commonest forms of chronic dyspepsia. It is chiefly this form which is the usual accompaniment of insufficientia pylori. The symptoms in this disease are caused by distention and irritation. As the surface of the intestine is vastly larger than that of the stomach, the consequent damage is also greater. The effect of the distention is not only that of fulness, but also of pulling. Another physical effect to which I would direct attention, in addition to that mentioned previously, is that all freely movable elastic tubes seek to assume a straight line when distended with fluids or gases. Therefore, a distended gut gives first the symptoms of distention, which is described by the patient as fulness and which is manifested by the necessity for loosening the clothing; second, the distended and freely movable part of the gut, obedient to the inexorable laws of physics, seeks to straighten out, and so doing pulls away from its mesenteric mooring. This causes pain at the site of the attachment of the mesentery to the spine, and thus is explained the pain in the lumbosacral region; third, the attempt to straighten out its flexures gives pain, especially at the acute flexures, and hence the acute pain in the right and the left hypochondrium corresponding to the hepatic and splenic flexures of the colon. In this case the most common mistake made is to refer to the kidneys as the source of the pain.

Irritation of the mucous membrane of the bowel causes contraction of the muscularis, causes peristalsis, and the greater the irritation the stronger the contraction. If the irritation continues up to a sphincter, it causes spastic contraction of that special sphincter. If the irritated sphincter is that of the pylorus, then there is spastic, stenotic contraction of the pylorus, attended by pain of greater or lesser intensity, according to the degree of the irritation. If the irritating matter reaches the sphincter of the ileocecal valve, then this opening will respond in the same fashion as does the irritated pylorus, *i. e.*, it will contract spastically, painfully. Symptomatically, the result here will be the same as the symptoms attending the spastic contraction of the pylorus and known as pyloric spasm, namely, severe pain.

It is this painful, spastic contraction of the ileocecal valve which has so far remained scarcely recognized, and which is being mistaken for appendicitis. This is the reason of so many mistaken diagnoses, and explains why with all the symptoms and with the proper location no lesion of the appendix is found at the operation. The morning diarrhea which wakes the patient, the chronic diarrhea which enervates the patient, the rectal tenesmus, rectal fissure, prolapse of the rectum, and hemorrhoids are among the results of chronic organacidia enterica. Hemorrhoids are supposed to be due to sedentary habits, but no one would attribute sedentary habits to animals. Hemorrhoids are produced by the spastic contraction of the gut. This spastic contraction is produced by the irritation of the enteric mucous membrane by the volatile acrid acids. This spastic contraction interferes with the return circulation and the small veins dilate. In the young child such spastic contraction and straining causes prolapse of the rectum. The acrid acid discharges produce excoriation, fissure, and tenesmus.

Membranous enterosia fungosa is of a chronic, insidious nature, and will be best understood when described at length.

In closing, let me again emphasize that the outlook for the chronic dyspeptic is of the very brightest, but that if not correctly understood and improperly treated diseases of other organs are bound to follow as the direct result of the improper digestion.

APPENDICITIS: WHEN TO OPERATE.¹

BY

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There were 49 deaths from appendicitis and its complications in Detroit last year (1904). From obtainable figures I estimate that there were almost 400 operations for this disease and its complications; the number treated otherwise could not be definitely estimated. In many of the eastern hospitals, operations for appendicitis form 10% or more of all operations. A disease so prevalent and with such grave consequences as this, calls for the earnest consideration and careful study of every practising physician. Do we feel that the masters even in our profession have a thorough understanding of the disease in its multitudinous aspects and that they have acquired the best ways of dealing with it in all its manifestations? I believe all are agreed that much remains to be accomplished from the dissemination of true advanced knowledge among the rank and file of the profession and from a higher education of the laity.

I have used the 49 fatal cases spoken of above as a basis for a careful study. To obtain full data even from such a limited number is no small task, and I have succeeded only in part in the time I was able to devote to it. My original list I obtained from the mortuary register of the Board of Health for Detroit. I listed all cases of undoubted appendicitis and all others which might have originally been such, as obstruction of the bowels, peritonitis, etc. Later from the attending physician in each case I obtained what data I could. Of the 49 cases, 44 were undoubtedly

¹ Read before the Wayne County Medical Society, May 25, 1905.

appendicitis or its complications; 5 were probably appendicitis, and 2 were called appendicitis, but proved to be otherwise.

Of the 44 cases of undoubted appendicitis, at least 4 subjects were not given the chance of an operation—probably there were 1 or 2 others. Of these 4, 1 refused; in 1 case the consultant said that it was too late; in 1 case the consultant stated it was not a grave enough case for operation, although the patient died the next day of general peritonitis.

Of the 44 cases of undoubted appendicitis, and the 5 cases presumably so, 25 were in males and 24 in females. The youngest patient was aged 7, and the oldest, 50; 6 were under 10; 14 were between 10 and 20; 12 were between 20 and 30; 7 were between 30 and 40; 5 were over 40.

The greatest number of deaths therefore occurred between the ages of 10 and 30. Of the 40 cases in which operation was presumably done, I obtained data in 28. Of these 28 patients, 1 died of concurrent diabetes; 1 of anuria; 1 of acute yellow atrophy of the liver; 1 of pulmonary abscess; 1 because he refused to allow proper care following operation. Of the others, 17 died of toxemia with shock in some cases, in a few hours; the others dying after two or more days from septic peritonitis.

In regard to the stage of the disease when the operation was done, so far as this could be determined, 1 was within 10 hours; 1 was early (bad conduct, not allowing proper care); 9 were on the third or fourth day; 12 were from the eighth to the twelfth day; 2 were still later; 1 was interval; 3 were secondary.

Pus was present in at least 13 cases and in at least 13 the appendix was removed. In at least 10 cases no attempt was made to remove the appendix, the operation being to drain.

Appendicitis is a surgical disease. W. W. Keen is quoted (vide Kelly p. 494) as saying: "The first indication in appendicitis is to call a surgeon." Diagnosis is our first necessity, and I believe it stands today as our greatest necessity. The fact that mistakes are constantly being made in diagnosing the true nature of the trouble early, cannot be emphasized enough. If every practising physician who is called upon to relieve trouble centering in the abdominal cavity would have "appendicitis" ever in mind, and absolutely eliminate that first in making his diagnosis, many scores of cases would not, as at present, go unrecognized. However, we have made much advance in this direction in the recent past.

A consideration of the pathology prefaces a better understanding of diagnostic values. It is to Dieulafoy that we owe the idea of "closed cavity," his theory being that appendicitis is the result of the transformation of the appendicular canal into a closed cavity at any point. This may occur in one of several different ways: (1) A calculus is slowly and progressively formed within the appendix, it is not passed into it from the colon, a veritable appendicular lithiasis; (2) under certain circumstances, appendicitis is the consequence of a local infection with tumefaction of the walls; (3) in other cases the closure may come about by the formation of a slow,

progressive and fibrous stricture; (4) or the cause may be a strangulation by bridle, bend or twist.

Clinically the trouble manifests itself as an attack when the closed cavity is actually constituted. It is then that the microbes, until that moment inoffensive, multiply and exalt their virulence. The lesion may heal spontaneously, at least, apparently (1) if the germs contained within the cavity possess but little virulence; (2) if they have lost their virulence by phagocytosis; or (3) if the canal again becomes permeable.

Otherwise, according to Dieulafoy, the appendicular infection ends in ulceration, in purulency, in necrosis, in gangrene, or in perforation, and thus gives rise to all the different varieties of peritonitis; or the microbes and toxins traverse the walls of the affected appendix without perforation and become the direct cause of any of the forms of peritonitis, either local or general, or with local or metastatic abscess.

The true and ample diagnosis takes into consideration the local condition, the virulence of the infection, and the balance established by the patient's reaction to these. Using the local condition as a standard, I would divide into the following stages: (1) The disease process is confined to the appendix; (2) the peritoneum is beginning to become invaded by bacteria and toxins penetrating the unbroken wall; (3) an active peritonitis is well under way, still localized; usually with pus formation, with or without rupture of the appendix; (4) a spreading peritonitis is attacking the general peritoneum; (5) a general peritonitis exists, with or without pus; (6) the general peritonitis is subsiding and a local walled-off abscess exists in the right iliac fossa or in the pelvis; (7) nothing remains but a local process (a) with pus, (b) without pus.

This classification applies generally, although the various stages do not exist in all cases; nor can we judge of the stage by the number of hours the disease has been manifest. In the first place, it is impossible to know the time when the disease process began. In the second place, once established, the rapidity of the progress varies greatly in different cases. In some cases a general peritonitis supervenes within a very few hours, with or without perforation of the appendix. In other cases the first localized process may run for many months without producing any general peritonitis.

Having arrived at a diagnosis of appendicitis, when shall we operate? When shall we not operate? Kelly, in his recent monograph, classifies operations into: (1) Early; (2) intermediate; (3) late; (4) interval. The early operation is undertaken while the process is still local. According to the foregoing outline this would come within the first and second stages. It is now universally agreed that when operation is done, this is the ideal time.

The intermediate operation is undertaken later during the third, fourth or fifth stage, as outlined. Cases vary greatly. Shall we operate at this time? Ochsner in his "Clinical Surgery" says: "Many authors advise immediate operation in all cases of acute appendicitis, without regard to the condition of the patient, or the stage of the attack, unless the patient is moribund on the one hand or improving rapidly under the treat-

ment." Then, referring to a patient before him, he continues: "Although this patient is very ill, she is not moribund; consequently her case would come under the class in which an immediate operation is advised by these authorities. In my own experience, and in the experience of all surgeons whose work I have had an opportunity to observe, patients in the condition of the patient before us have almost invariably died within 24 or 48 hours after the operation. These cases belong to a class in which operative treatment has an especially high mortality. In fact, by far the greater portion of all fatal cases following appendicitis operations belong to this class. These cases have been said to be too late for an early, and too early for a late operation."

Kelly, Deaver and many other authorities advise no such delay to be followed as a routine. What do we do in Detroit, and what lessons can we draw from our collected data? Out of an estimated total of 400 operations, 2 patients died after early operation, while at least 20 died when operation was done from the third to the twelfth day, the highest mortality being on the third and fourth days. In most of these cases, the appendix was removed, and the patient died within a few hours from toxemia with shock in some cases. The lesson to be taken from this is that the intermediate operation is exceedingly dangerous, and when undertaken, very little handling of the bowel should be done, the appendix being removed only when it is easily accessible. I have asked several of the representative operating surgeons of Detroit their rule of procedure in this class of cases, and I found great variance. To me it seems as if the safest general rule is to operate only when general peritonitis is not present. Await symptoms of localization. If a surgeon's own experience and skill allow him to be more venturesome, he may accept more cases at this stage for operation. It seems greatly to be desired that the profession should adopt a common basis upon this, if it is at all possible.

In regard to late operations, no one questions the advisability of evacuating pus.

In regard to interval operation, the only question which arises is whether we shall operate if a patient has safely passed through his first and only attack. If it has been unquestionably an inflammation of the appendix, especially if after-symptoms remain, operation is indicated; but if the symptoms are mild, and clear up entirely after the attack, it is generally conceded to be best to await symptoms of an oncoming second attack before operation, in the meanwhile keeping the patient under close surveillance.

When shall we not operate? In cases seen early, John B. Deaver lays down the rule that every case calls for operation, pointing out that we never can be absolutely sure that a case with a mild beginning will run to a favorable termination. If this rule were applied in Detroit, how many of the 49 who died last year, nearly all in the prime of life, would be alive today? It is well recognized that in this stage the mortality is practically nil. If these 49 subjects had all been given the chance of early operation, we cannot but believe that at least 40 would have survived—possibly more. Two were given this chance. In one instance, a child, operated on by a

competent surgeon, died about six hours later. This case was one of the fulminating type and was hopeless from the first. The other patient underwent a successful operation and was doing favorably, but his conduct was such that no one could do anything for him, father, mother, nurse or physician. Why were not all given this chance? I have not full data in all cases, but from what I have, and from general experience I might cite the causes as follows: 1. Patients, remaining in ignorance of the real nature of their ailment, and hoping for a betterment of their condition from the use of simple remedies, fail to consult a physician. To combat this calls for a more widespread appreciation of the gravity of the symptom of pain in the abdomen. 2. Physicians fail in some cases to make an early diagnosis. This calls for a better ability on the part of all practising physicians to recognize the nature of the trouble early. Practically no case need go unrecognized if careful study is given and the physician is amply equipped mentally. In the doubtful cases a general diagnosis can usually be made whether or not it is a case for surgical intervention. 3. Environments are unfavorable for a successful operation and better environments are impossible. This cause is often difficult to deal with, each case calling for its own solution. 4. Patients refuse to undergo operation or even to go to a hospital when symptoms are not urgent. This often presents the most difficult problem and at times becomes insurmountable. However, if we would all have the full courage of our convictions at all times, giving free and full expression to them, this barrier would continue to diminish. The patient who has enough confidence in a physician to call him, will usually accept his advice if it is backed by his honest convictions. 5. Physicians are loth to advise or to urge early operation in so-called mild cases. Here we have wide latitude for discussion. In the Practical Medical Series for 1905, reviewing the previous year's literature, Murphy says: "A study of the literature from year to year reveals a slow but sure change of opinion among internists as to the proper method of treatment in appendicitis." Quoting from Tyson, he continues, "in all cases in which the diagnosis is established, the patients should be operated on at once, without waiting for a second attack, even if the symptoms subside rapidly." Kelly says: "Now is the accepted time for operation." I have already cited Deaver's recommendation that all cases call for operation. Shall we accept this rule? Do we accept it? I have put this question to some of the surgeons of Detroit, men of wide experience and mature judgment, and I find opinions are at variance. One contraindication all will accept—when the patient is so profoundly sick at the start that we feel an operation would kill him, and we wait for a possible abatement of symptoms.

Advocate Tuberculous Home.—At a public conference at Bishopstead, near Wilmington, Del., Dr. William M. Welch, of Philadelphia; Judge George Gray, Governor Lee, and Bishop Coleman advocated the establishment of a sanitarium for the tuberculous. Miss Miggett, of Philadelphia, offered to give five acres at Iron Hill as a site for the institution. No definite action was taken.

LIFE INSURANCE COMPANIES AND THE PREVENTION OF TUBERCULOSIS.¹

BY

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The object of this brief paper is to call attention to a fact that seems likely to be overlooked, namely, that life insurance companies have a vital interest in the war against infectious diseases. Their interest is definite and practical, because that loss which to mankind in general is dilute, widely distributed, and for the average individual sentimental rather than actual, is to them direct and concrete. In a masterly paper read before the British Congress on tuberculosis in 1901, Frederick L. Hoffman, Statistician of the Prudential Insurance Co., said, "The intimate relation of life insurance companies to problems of preventive medicine and modern sanitary science is not a matter of opinion but of fact," and again in replying for his company to the question as to whether or not they would contribute to the erection of sanatoriums for the treatment of policy holders suffering from tuberculosis, he says, "While these companies are not philanthropic institutions, and while they cannot erect or maintain sanatoriums for the tuberculous, they can and will, I am sure, aid you materially to attain the objects for which this Congress has been called together."

But mutual life insurance companies are primarily philanthropic institutions; they seek to give protection at the lowest possible cost to the insurer, and every dollar spent for unnecessary death loss means a needless and avoidable increase of the policy holder's burden. Recognizing this fact, the Congress of Fraternal Orders has actually developed a plan for the erection and maintenance of large sanatoriums, and every corporation that insures lives should take a deep interest in promoting the beneficent purpose of this association. The diminution of mortality, so evident in the vital statistics covering the past 10 or 15 years, has benefited life insurance companies but little, falling oddly enough in favor of advanced ages and female lives.

In industrial insurance, tuberculosis is charged with 40 % of the total mortality at "the most important ages," in other words, this mortality falls upon that which is for a life insurance company the most disastrous period, the early years of insurance. One company alone pays out annually to the beneficiaries of its tuberculous policy holders, about \$800,000, representing 6,000 deaths, and the average loss on each policy is more than five times the amount received in premiums. In one of the "big three" the loss from tuberculosis has constituted 12 % of its total mortality; 60 % of this loss occurred at rela-

tively early stages, and over half of these policy holders paid premiums for less than five years. The level premium companies alone pay out nearly one-half billion dollars annually for death losses, and of this over \$6,000,000 is the tribute exacted by tuberculosis.

I will not burden your minds further with figures, for it would seem that enough has been said to show that we should be able to enlist the active aid of these great corporations and of the fraternal orders. As every dollar of avoidable loss means an unnecessary increase of insurance cost and diminished dividends for the policy holders, it is fair to ask whether there is any practical method by which the insurance companies can eliminate that portion due to tuberculosis.

I have on several occasions pointed out some of the reasons that lead to this extraordinary mortality experienced by life insurance companies. It is primarily due to imperfect methods of selection which render it an easy matter for the victim of incipient tuberculosis to pass an examination, and what is more remarkable enables some who are in advanced stages of the disease to secure policies as standard risks. For many years I have been in the habit of making some special inquiries as to the insurance held by patients presenting themselves for examination or treatment at the office of the hospital and have also made the most of an abundant opportunity to study the insurance history of those rejected by the company that I formerly served in the capacity of medical director. In far too many instances most obvious cases had received insurance without the least difficulty. The incipient cases are seldom rejected and it is probable that the high early mortality in those of light weight means that many of these were already infected.

Poor primary selection in the latter class is readily explained by the purely formal way in which the ordinary life insurance examination is conducted. Unfortunately, the general attitude of the medical profession evinces a lack of faith in the sincerity of the claims made by the different companies in relation to careful selection and it is generally believed that careful work means a shortened tenure of office for the man who undertakes it.

The older forms of medical reports, and many at present in use are not adapted to modern requirements, the case history being so overloaded with minutiae and the amount of clerical work required being so great that the really essential features are obscured and the all-important physical examination slighted. If, however, it were assumed that all life insurance companies would employ the best medical talent available, and that every examiner was convinced that careful and conscientious men were in every case protected, there would still be a heavy mortality from this disease, because of the added difficulty pertaining to the diagnosis of early cases in the absence of a truthful report on the part of the patient himself.

¹ Read before the National Association for the Study and Prevention of Tuberculosis at its first annual meeting, May 18 and 19, Washington, D. C.

One of the most interesting of the phenomena in relation to life insurance is that curious self-selection against the company on the part of those who are in a condition of impaired health. Every man who has served as a medical director has been forced to recognize the humiliating fact that common honesty is largely lost sight of under the stimulus of the need for life insurance. This is well shown by the difference in mortality experienced by life companies on short endowment policies, as compared with the cheaper forms of insurance. In the former, the self-selection is distinctly favorable to the company, as the man is betting on his own life and health; in the other, the selection against the company is likely to keep pace with the diminishing cost of the insurance.

While, therefore, the life insurance companies might and should do much more to guard their entrances and protect their sound policy holders, they will never be able to overcome the heavy loss from tuberculosis, except through just such work as this society has undertaken. Having these facts in mind, I venture to suggest that the following steps be taken by the executive officers of this society:

That they (a) bring into active membership the medical directors of life insurance companies. (b) Emphasize the fact that the prevalence of tuberculosis constitutes the chief factor in early insurance mortality, and is therefore a matter directly affecting each and every policy holder. It is to them a matter of business if not of philanthropy. (c) Seek to secure the active aid and cooperation of the companies in our attempts to secure the passage and enforcement of laws directed to control tuberculosis, whether these relate to the building and maintenance of State or national sanatoriums, or to other vital matters. (d) Arrange for the issuance of uniform sets of circulars, giving in plain and simple language such information as will serve to educate the masses, and (e) request that such literature be printed and circulated by the companies through their agents and their ordinary mail service.

I believe these suggestions to be thoroughly practical and feasible, and that by thus enlisting the support of these powerful bodies, we would obtain, in a few months, results which would represent years of effort along the usual lines.

Let us in this great campaign to which we stand committed bring to our assistance every factor that can be made potent for good, whether it represents dollars and cents, civic pride, love of family, or humanitarianism.

Research in Serum Pathology.—The Indiana University, Bloomington, Ind., announces that the position of research assistant in serum pathology for 1906-1907 is open for applicants. Candidates must have completed at least two years' work in a medical school of high grade, and must have a fair knowledge of bacteriology, of general pathology, and of volumetric and gravimetric methods of quantitative chemistry.

SPECIAL ARTICLES

SOME QUESTIONS OF THE LEGAL RESPONSIBILITY OF INEBRIATES.

BY

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A serious crime is committed by a person intoxicated in the general sense, or at least under the influence of alcohol; a will is written while the person is using spirits to excess; an important contract is made and signed in this same condition; a course of criminal conduct is followed, in which the actor is using spirits constantly to excess.

Such cases are constantly coming into court. The counsel turns to the physician for help. There is some abnormality in each instance. The acts are without the pale of reason, and the continuous use of spirits clearly disturbs the natural common sense line of conduct of the person. The lawyer turns to the rulings of judges in similar or allied cases, and the physician to textbooks of medicine and medical jurisprudence. Both fail; while the lawyer finds rulings that apparently apply to such cases, he is conscious that they do not comprehend or recognize the real facts at issue. The more closely he studies these facts, the wider the discrepancy between them and the theories of the law. The judge recognizes this inconsistency, but is forced to follow lines of previous rulings, and only along certain narrow limits dare he venture to express opinions at variance with others. The legal theories of these cases are the outgrowth of the moral teachings of past centuries. Such teaching shows that inebriety is a moral depravity innate in every life, always ready to grow and develop, and particularly from wilful neglect and gratification of the lower animal instincts. Also that inebriety is always a phase of savagery, or inborn tendency to lawlessness, and giving up of restraint and control; indulging the passions regardless of society or the interests of others. The remedy is punishment, suffering, pain; and in this way building up the moral to control the lower animal.

Lord Coke's rulings three centuries ago that inebriety always aggravated the offense and should be followed by increased punishment, has been accepted and acted upon as the central truth since that time. The physician who is called into court to assist in reaching equitable decisions in such cases, finds little or no help from the textbooks. Dogmatic statements and theories that are obviously unsound and in conflict with the facts comprise the largest part of the so-called authorities on this subject. The physician turns to a study of the cases and seeks to find out the facts as they are presented in real life. Here a new world of truth confronts him.

The inebriety of the prisoner is found to be a physical condition that is both inherited and acquired. This physical condition is literally a disease and is practically an obscure or pronounced form of insanity. In some cases the drink craze is a symptom of insanity, and *vice versa*. When the symptoms in a large number of cases

are studied and compared they are found to follow a uniform line of origin, progress, and development.

Taking up the story of the effect of alcohol on the system, it becomes clear that the continuous use of alcohol, or spirits taken to excess at intervals, is followed by degrees of brain and nerve palsy, paralysis, congestion, and impaired and diminished activities.

Alcohol when used to excess is followed by incapacity of the senses and judgment, with lessened power of control. The degree will vary widely with the amount taken and the state of health, but impairment and disability is a physiologic consequence; this is absolute, to which the exceptions only prove the rule.

The legal theory on which the present administration of the law is carried out assume sanity and sufficient mental soundness both to recognize and act differently, the remedy for which is more severe punishment and accountability.

Practically this theory presupposes a degree of psychologic knowledge and capacity to distinguish lines of health and disease that is far beyond any present attainments of science. The conclusions from a medical study is that every case is one of physical degeneration and progressive march downward; a dissolution that follows a continuous line of cause and effect that can be seen and recognized. These persons are not suffering from metaphysic theoretic states of the mind and will power, but from actual tangible conditions which follow with absolute certainty causes that may be known and are traceable.

The real medical jurisprudence of inebriety is, first, a question of the facts in each case and their meaning. Facts of heredity, of growth, of culture, and health; facts of disease, of injuries, of degenerations, local and general; of the influence of surroundings, of occupation and climate, and all the history, physiologic, pathologic, and psychologic. From these facts only can any clear intelligent conception be formed of the act and its motives. When this is settled then the legal question of what shall be done and what disposition will serve the cause of justice will appear. The medical jurisprudence of inebriety theoretically aims to check and prevent the illegal acts of inebriates. But practically and literally the very opposite effects follow. Experience of all courts in this country and Europe agrees that capital punishment for murder committed by inebriates never deters other inebriates from committing similar crime. Yet notwithstanding this fact, inebriates are tried and executed daily all over the country.

Fines and imprisonment for illegal and criminal acts are not only absolutely worthless as deterrents, but increase the very condition which it proposes to check. The physiologic fact in these cases is that legal penalties which are supposed to appeal to the higher moral brain make no impression, for the reason that the higher brain is so impaired and palsied that it cannot recognize or respond to these influences.

The question of the legal responsibility in any given case in which spirits has been used before and during the act in question must be decided from a study of the mental health of the person. If there is a reasonable doubt of the mental soundness at the time the act was

committed, the degree of responsibility will be changed. If there is evidence of delusions, or strange, unusual beliefs which influence his conduct and warp the judgment; or if the mind acts in an impulsive, unreasoning way, apparently under an irresistible impulse that is beyond control, incapacity should be expected. The question of capacity to distinguish between right and wrong in all such cases is difficult and confusing.

The immediate effect of alcohol is to obscure and break up this power of discrimination between right and wrong. Its use is always followed by an increase in the heart's action, and later a corresponding diminution of the flow of blood. This increased action of the heart is followed by unsteadiness of brain force and activity, and this extends to all parts of the body, giving the appearance of greater power, then after a time lessened power and energy until stupor comes on.

In all persons who use alcohol this alternation of exhilaration and depression occurs, and when this is repeated for years positive damage follows. First of all, the senses become impaired, and this always darkens knowledge and misleads the judgment.

This follows from the fact that accurate perceptions are wholly dependent upon definite and normal sensations. When the senses are disturbed and impaired, perceptions are correspondingly disturbed; they are unable to present the facts to the mind as they are or as they really exist in the surroundings.

The fine shadows, the uncertainties and doubts which attend all human transactions escape the notice of the inebriate, hence he imagines they do not exist. The more alcohol he uses the more positive things appear; they have the quality and energy of absolute demonstration. He never doubts or hesitates. Such a man is a dangerous witness in criminal courts, because his defective knowledge has a morbid positiveness that often carries conviction.

In reality an inebriate witness testifying to events observed while sober is more reliable than a sober witness testifying as to events observed while intoxicated. The inebriate is literally in a state of anesthesia, manifested by the rude grasp of the hand, a loud voice, and certain exaggerations of manner, as if to assure himself of the reality of his senses.

The sense of touch, of sight, of hearing, of smell, and the muscular sense, all show disturbance, and point to a degree of paralysis which manifests itself in illusions, hallucinations and perversions, impeded articulation, staggering gait, and diminished functional and organic activity. This is literally paralysis in a degree, and extends to the control of volition. No effort of will can remove or lessen these incapacities from alcohol. Weakness, prostration, and debility respond in some measure to the calls of volition, but paralysis from alcohol never. Hence, the responsibility of the inebriate is lessened and differs from that of all other narcotic states in direction and degree.

It can be readily seen how impossible it is for the mind to receive accurate knowledge of persons and events exterior to it when the senses are obscured and imperfect; also when this degree of paralysis extends to the higher operations of reason and coordination,

where both the facts and the conception of them are faulty and perverted. The coordinating brain centers are enfeebled and cannot analyze the impressions of the senses, and this extends to those higher operations of the brain called morals. The paralysis of the lower ranges of brain activity quickly dulls and breaks up those fine distinctions of duty and the consciousness of right and wrong. It is a physiologic law of growth and development that the highest elements of brain activity and power are formed last. This is called the character, the "moral" of the man, and from the use of alcohol it appears to be the first to suffer and be destroyed.

The inebriate, like the man intoxicated, exhibits confused, halting ideas and beliefs of morals and his duties to his fellow man. His ethical sensibilities and conceptions of duty and obligations undergo a progressive degeneration, while the coarser organic operations of the mind and body seem but little disturbed. Hence the acts and thoughts that are supposed to be malicious and brutish indicate merely a suppression of the higher coordinating centers. This is seen practically in many cases in which persons of refinement in thought and act, after the use of alcohol, have become coarse in language and manner, also brutal in conduct. Often the inebriate is amazed when told what he has said and done while under the influence of alcohol, showing how far he has been dominated by the alcoholic paralysis. But if the drinking has been continuous, he is unable to review his thoughts and acts and both the mind and body undergo debasement that becomes fixed.

Morally, mentally, and physically, he slowly or rapidly grows crippled and deformed. The inebriate is literally a moral paralytic, his intellect is disordered, and among the insane none is more dangerous, for the reason that he has no fixed mentality or conception of himself and his relations to others. He may, before the use of alcohol, have formed habits and conceptions of life that cling to him automatically, and thus be able to appear and act along the ordinary grooves of normal life. He may, as a professional man or as an artisan or farmer, pursue his avocation with reasonable success; but let some supreme crisis intervene, let some emergency throw him out of his automatic range of life, and his true state will be revealed. His damaged brain will be seen in the crimes and the insane confusion of all his thoughts and acts.

The conclusion is sustained beyond all question, viz., that the effects of alcohol on the brain and nervous system are anesthetic and paralyzant. The heart, the senses, and then the higher brain centers slowly succumb to paralysis, while the victim's capacity to realize his true condition and adjust himself to it grows less and less. His conception of right and wrong, of duty obligation and responsibility grows more and more confused. Often this is masked by automatism, and the victim may perform his daily routine in accordance with his surroundings, but he is a mere mental walf, drifting at the mercy of his surroundings and the uncertain conditions of functional life. The mental incapacity of inebriates to reason clearly about their acts and the consequences of them is fully sustained by the facts of heredity. All statistics agree that over 80% of all

inebriates are born with defective brains and nervous system. Their ancestors are inebriates, insane, epileptic, idiots, feeble-minded, neurotics, tuberculous, and others who are diseased, and who transmit to their children either special disease tendencies or general constitutional defects. These classes are wanting in brain, health, and vigor; they are unable to bear the strains and drains of life or adjust themselves to its changing conditions. If they do not inherit a special tendency to alcoholic disease they have a defective brain soil from which disease springs upon the slightest exposure. As shown by their defective external appearance, the brain and nervous system are imperfectly formed, dwarfed, and incapable of acting normally. The effect of alcohol on such an organism must of necessity reduce it below the plane of healthy activity and responsibility. These are general principles that are beyond question in the field of scientific inquiry.

The fact I wish to make prominent is not altogether the irresponsibility, legally, of these subjects, but to show that the present legal standard of judgment is wrong and contrary to all teachings of science. The superstition that insists on full measure of accountability in all cases in which spirits are used, and assumes that the use of alcohol is a voluntary act of brain, both conscious and capable of control, is a sad reflection on the intelligence of the present.

The interpretation of the law that boundary lines of responsibility and irresponsibility can be marked out in these disputed cases of inebriety is a delusion. The effort to find a dividing line where sanity and insanity join, or where the brain could or could not have controlled its acts or realized their nature, is an impossibility. The strange theory which seems to be fixed in the legal conceptions of inebriety, that alcohol can be used to excess at times, or continuously, and the person retain the full possession of his faculties and have the same power of control as in health; also, that no history of excessive use of spirits before or during the commission of the act has any bearing on the case unless associated with marked symptoms of insanity, are all errors that make justice impossible in these cases. Today a large percent of all medicolegal cases is associated with inebriety and the use of spirits, and the legal responsibility by which they are judged is based on theories urged centuries ago. The actual legal responsibility and accountability of these cases is very different from that seen in courts of justice.

The teachings of modern science open up a new world of facts that indicate clearly the physiologic nature of all brain activities. Facts that show the influence of heredity, of injuries, of disease, of strains, of drains, of failures, of diet, of surroundings, of culture, of ignorance, and all the vast ranges of influences and forces which enter into the acts and character of each one. Facts that show a march downward, and progressive degeneration, or development and evolution. It is from this evidence that the questions of responsibility and capacity to act sanely at any time and under any circumstances should be studied. No legal responsibility in inebriety can be solved from any other point of view, or from any theories. It is a pure question of facts, not theories of

the law, or rulings of judges. What is the history of the man and act in question? Ascertain these clearly and the problem is solved; fail to do this and confusion, injustice, and wrongs follow. The legal responsibility of inebriety as administered by courts today is a farce. A new jurisprudence is demanded, a new scientific study and recognition of these subjects and their disabilities is called for. This demand is felt in every court of justice by clear, thoughtful men.

DIGEST OF MEDICAL LITERATURE

CLINICAL MEDICINE.

DAVID RIESMAN A. O. J. KELLY
NORMAN B. GWYN BERNARD KOHN
 HELEN MURPHY

PIROPLASMOSIS.

A CRITICAL SUMMARY.

BY

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The wise man's aphorism that "there is nothing new under the sun," though guaranteed as to its accuracy in regard to the existence of facts by the authority of inspiration, does not at all apply to the discovery of such by mortals of more limited sapience. New discoveries are year by year throwing new light on old facts, and giving satisfying interpretations to venerable scientific puzzles. This truth is as frequently exemplified in clinical research as in any other department of human investigation. One of the most specially interesting of the recent additions to the furniture of our clinical armamentarium is, as of course all know, the unraveled mystery of Piroplasmosis. This newly-named disease prevails in Madras, where its nature has been successfully investigated by Major C. Donovan, I. M. S. The symptoms used to be regarded as indicative of "chronic malaria." In his report last year, Major Donovan tells us that: "I had noticed many cases of chronic irregular pyrexia, with enlargement of the spleen and occasionally of the liver, bronchitis, edema of the feet, subcutaneous hemorrhages, chiefly of the petechial type, diarrhea of a dysenteric nature and cancrum oris. The treatment was most unsatisfactory, no drug having the least beneficial effect. Such cases were being registered in hospital as chronic malaria, but as I was not a believer in the pyrexia of malaria unaccompanied by parasites in the peripheral blood, I, for the nonce, classified the cases as enlargement of spleen, cause unknown, notwithstanding I had quite a lurking suspicion that there might be some at present undiscovered stage of the malarial hematoozoon which might be the cause of these irregular pyrexias, that there were resistant forms of the genera *Plasmodium* and *Laverania*. With a view to remove this doubt I attended the post-mortems and took smears of blood from the spleens of cases said to have died of chronic malaria. On the first day, April 9, 1903, I found in a slide containing such a smear numerous peculiar round and oval ring-like little bodies, with two masses of chromatin situated on opposite poles; convinced as I was of their parasitic nature

I could not, however, refer them to any group of the protozoa. I thought I had discovered the long-sought-for resting-stage-form of the malarial parasite in man. But on procuring the same bodies in two other cases on April 23 and 24, 1903, I changed my view and considered that they might be postmortem degenerations of the nuclei of the splenic pulp cells."

Leishman's Observations.—The curious coincidences which direct contemporary inquiring minds along converging lines, and thus, among more fortunate results, tend to complicate the history of scientific discovery, receive an interesting illustration in the discovery of the pathology of piroplasmosis. Major Donovan's report tells us how he received the *British Medical Journal* of May 30, 1903, on the fifteenth of the following month, and there found an account by Major Leishman, R. A. M. C., of organisms identical with those which he had himself discovered. He adds: "I at once recognized the similarity of what Leishman called degenerations of the trypanosomes to the bodies found by me in the spleen blood of the three cadavers above mentioned." Major Donovan had then under his care in hospital a native boy of 12, "suffering from irregular pyrexia of two months' duration, enlarged spleen, half-way down to the umbilicus, no malarial parasites in his peripheral circulation after very careful examinations of stained (Romanowsky) specimens, although there was a well-marked increase of mononuclear leukocytes." He punctured the spleen of this boy on June 17, 1903, and found bodies in the blood which were identical with those that he had discovered in the postmortem specimens. "The forms were larger, more varied, and more clearly defined." On the following day he sent an account of this discovery to the *British Medical Journal*, which appeared in that paper on July 11, 1903.

In his later report of last year (contributed to the annual report of the Government General Hospital, Madras) Major Donovan tells us that: "Incited by Leishman's statement that these bodies were degenerations of trypanosomes, I carefully searched for this class (*Mastigophora*) of the protozoa, but without success, nor up to date has anything bearing the least resemblance to these organisms been found. I was at the time well acquainted with the appearance of trypanosomes, especially with the species *Evansi*, *Lewisii*, and one commonly existing in the blood of the Indian squirrel (*Sciurus palmarum*), so knew what to look for." On June 16, 1903, he had "sent Ross three slides of these bodies (called for the time 'resistant bodies,' as they resisted the action of quinin, and indeed of all the drugs), together with two temperature charts of Cases Nos. 1 and 2 and a water-color painting." On September 23, 1903, he forwarded a slide containing the bodies to Mons. Mesnil, of the Pasteur Institute, Paris, and asked the favor of his obtaining Laveran's opinion as to their nature. The reply, dated October 15, 1903, was received by Major Donovan on November 1, 1903. The decision which it announced was as follows: "L'avis de M. Laveran est de plus nets; il s'agit d'un protozoaire nouveau, du genre *Piroplasma*. Puisque la ponction de la rate est faite *intra vitam*, il ne saurait s'agir de formes d'involution de trypanosomes. M. Laveran écarte également l'idée de

formes appartenant au genre *Plasmodium*, c'est-à-dire à l'hématozoaire du Paludisme." On November 9, Ross' opinion (dated October 21, 1903) reached Major Donovan: "We have all carefully studied your excellent preparations, and I have read the articles by Leishman and you. I have also sent your drawings and specimens to Leishman and enclose a copy of his reply. You will see that he considers the parasites found by you to be the same as his. I think that the bodies are certainly parasites, but I cannot see any evidence at all that they are related to trypanosomes. . . . Hence, I feel very strongly that the parasite is an entirely novel one, and therefore consider that the discovery is one of great importance. . . . It is possible that the parasites are the cause of the fever in the cases, and this fever appears to me to resemble that of kala-azar."

Report of MM. Laveran and Mesnil on the Piroplasma Donovanii.—A translation of the report presented to the Académie des Sciences by MM. Laveran and Mesnil regarding Major Donovan's preparations was given in the *Indian Medical Gazette* of August, 1904, under the heading of "*Piroplasma Donovanii*." It contains the following: "The preparations which have been sent in liberal numbers to us by Dr. Donovan have to do with several of these cases, and besides smears of the spleen pulp they comprise smears of the liver tissue, which also contain the parasites. . . . The parasite exists in the form of small, pyriform, oval, or spherical bodies, lying free, or within the red-blood cells; the pyriform bodies, of which Ross had made no mention, being the most numerous in some of the preparations; their form reminds one exactly of the most typical specimens of *Piroplasma bigeminum* of 'Texas fever,' and doubtless they represent the typical form of the human parasite which we are describing. They measure 2.5μ to 4μ in length by 1.5μ in breadth. In them, as in the oval and spherical forms, one can make out a chromatin-sphere—most probably the karyosoma—which is of considerable size, and in the pyriform lies usually toward the broader end. In the same transverse diameter there is generally found another mass of smaller size, round or rod-like, which is sometimes joined to the greater mass by a slender pedicle. The remainder of the contents of the parasite is finely granular and fairly clear. The peripheral red cells undergo a rapid change: they become paler, do not, when stained, stain in the same degree as the normal xanthocytes, and become granular. A single xanthocyte usually contains from 1 to 7 or 8 parasites—1 most usually—without being markedly enlarged; we have, however, observed a xanthocyte which contained 14 parasites and was nearly three times the normal size. Ross does not believe that endoglobular forms of the parasite exist; but we consider that it is hard to interpret otherwise the numerous figures which we have seen, and to which Donovan had drawn our attention, and which Ross had also seen. We would merely note that (1) some of the parasite-containing cells still retained their normal reaction to staining, as a whole, or at the periphery; and (2) the quantity of matter outside the parasites is the greater the less the number of parasites, a fact which our hypothesis easily accounts for, but which is hard to explain by Ross' idea of 'matrices in which spores are produced.'

Leishman agrees with us in admitting the existence of true endoglobular (intracellular) forms. And we would finally mention the fact that the parasite-containing xanthocytes, which are absent in smears made postmortem, abound in smears made *infra vitam*, being the more numerous the better the preparation. However, the free forms are always more numerous than the intracellular forms. The fact that intracellular forms exist leads us to believe that the parasites should be found, at a favorable moment, in the peripheral circulation. Donovan has informed us that he has not yet found them thus, and they were absent in a blood preparation which he sent us. In a considerable number of cases we have seen parasites, and always in a perfect state, within mononuclear and polynuclear leukocytes—their number varying. Some of these appeared to be within the nucleus of the leukocyte, and in these cases the nucleus had always undergone a change.

"The reproduction of the parasites appears to take place by fission into two or more parts—usually two, the great chromatin mass becoming divided into two and the pyriform body, which has scarcely increased in size, splitting longitudinally; where fission into more than two parts occurs the parasite becomes spherical and undergoes a progressive enlargement, its nucleus soon undergoing division. We thus find bodies whose diameter may be as great as that of a xanthocyte, and which contain 2, 3, 4, 5, or 6, and at most 8, large chromatin masses, the small masses of chromatin being less numerous or altogether absent. Those bodies which contain 4 to 8 nuclei are very like xanthocytes containing so many parasites, and it requires sometimes a good deal of care to distinguish between them. Ross must have confused these two varieties. When their evolution is near its end, there apparently takes place a radial division of the parasite into mononuclear elements, certain rosettes, which we have observed appear to us to be thus caused. During the course of their evolution the parasites contain no pigment."

Classification of Piroplasma donovani.—"What place shall we give to this new organism? The almost constant presence of the smaller chromatin mass, so like the leutrosoma of a trypanosome, makes one of course think of that parasite, or at least of a flagellated parasite; but we have not been able to stain a flagellum any more than Donovan or Ross has been able, and for this reason we consider that this hypothesis may be eliminated. The facts which we have observed show that there is no essential difference between the Leishman-Donovan parasite and those piroplasmata which are already known to us—especially the typical *P. bigeminum*; the pear-shape and the longitudinal fission into two are the rule as in it, while the fission into 4 or more is sometimes found in the piroplasmata; and, finally, the existence of intracellular forms removes every objection to this view. We are forced then to retain the name *Piroplasma donovani*, which we gave to the preparation in our first note on it."

Further research enabled Major Donovan to report in the *Indian Medical Gazette* of August last that he had found in the peripheral blood of another patient intracellular forms which appeared to him to present a certain

degree of resemblance to those of the genus *Piroplasma*. He was able to discover them only when the temperature had reached 89° C. to 89.5° C. (102.2° F. to 103.1° F.), and they existed in but small numbers even then. The water-color drawings and stained preparation which he forwarded to the *Indian Medical Gazette* were thus reported on in that journal:

"The parasites are few in number—one has often to examine several fields with a Verick ocular No. 1 and $\frac{1}{8}$ immersion lens to find one ball point. They are chiefly intracellular, but are also found free, and are small, smaller than those seen in smears from the spleen. Their form is that of a regular sphere or oval, their diameter being no more than 1μ to 1.5μ , the karyosoma being small, rounded or elongated, and lying always at the periphery. In one xanthocyte we have observed two parasites still joined together, evidently the result of fission into two. Unlike what is seen in the bodies from a spleen smear, no accessory karyosoma is found lying beside the chief karyosoma; but it must be remembered that in the blood we have to deal with very young parasites, and we have already mentioned the fact that the nuclear structure of those bodies which are undergoing fission is simpler than that of those which have attained their full development. The xanthocytes which contain these small parasites have undergone no change, unlike what one finds in the case of xanthocytes containing more highly developed parasites, such as we find in smears from the spleen. The small intracellular forms of *P. donovani* bear a striking resemblance to the smaller forms of the malarial parasite; but there are certain points of distinction which to us appear sufficient to avoid confusion between the two; the smaller forms of the *haemamoeba malariae* contain vacuolated nuclei, whose structure differs from those of *Piroplasma donovani*; and the karyosomes of the former do not resemble those of the latter parasites, while together with the small forms of the former are found larger bodies whose volume is markedly greater than that of *P. donovani* as found in the general circulation. Nor will *P. donovani* be taken for hematoblasts, whose contour is less distinct and whose karyosoma is hardly distinguishable from its protoplasm, unlike that of the parasite." Major Donovan also states (The Lancet, September 10, 1904): "On February 13, 1904, I found the organisms in ulcers of the skin of patients suffering from piroplasmosis. I was led to look for them in such skin diseases by the discovery of Wright, of Boston, of bodies very similar to, if not identical with mine in scrapings from oriental sore (Delhi boil)."

Clinical Features of Piroplasmosis.—With regard to the clinical aspects of piroplasmosis, Major Donovan tells us "that the most characteristic feature about this disease is an enlarged spleen, irregular pyrexia of from two to six months' duration unaffected by quinin, and the absence of malarial parasites in the peripheral circulation." Of the individual symptoms we are told that:

"The temperature is of an irregular type with occasional periods of apyrexia; in the beginning it is markedly intermittent, varying from 97° F. to 104° F., of daily occurrence associated with shivering; in the latter stages it takes on more of a hectic type with night-

sweats. In a few cases the intermittent temperature occurs twice a day, morning and evening. When any complication is present, as pneumonia or cancrum oris, the pyrexia is continuous or subcontinuous. On occasions without any recognizable cause, the temperature sinks to normal or subnormal and remains so for a week or ten days, rarely even for a month. The spleen is enlarged in the vast majority of the cases; in five only out of 72 was no enlargement of this viscus noted. The enlargement is as a rule not very great, the spleen extending half-way down and to the level of the umbilicus; in half a dozen cases did the extension take place into the pelvis. The size of the spleen varies according to the temperature; in some instances the variation in size has been marvelous. With fever the spleen has been below the umbilicus and in a week or ten days on the onset of a pyrexia the organ has contracted and disappeared underneath the ribs. This diminution is but temporary; on the recrudescence of fever the former enlarged proportions are assumed within a few days. The liver is not so invariably affected in size; it was only in 28 cases that an increase in bulk was noticed, usually to the extent of from one to two inches below the costal arch. Diarrhea was present in more than half the cases (40 out of 72); the motions were of a dysenteric character with slime and blood. This intestinal symptom was not always a constant feature, but recurred with the severity of the disease. In the stools occasionally ankylostomata, rhabdonemata, and balantidia were found, but they apparently had no connection with the disease. The large intestines were often the seat of ulcerations; their perforation gave rise to peritonitis and death in some cases."

Skin eruptions were very common. The skin was dry, furfuraceous and covered in places with small ulcers simulating those in scabies; the marked pruritus consequent in these skin affections brought about in several cases an extension in size of these ulcers which had then, indeed, a great resemblance to Delhi boils. In ten of the number subcutaneous hemorrhages or petechias were noticed, especially over the chest and leg; these came and went, and were as a rule a prognosis of bad augury. In the greater number, pigmentation of the skin in some form or other was detected on the palms of the hands and the soles of the feet; in a few cases was such a change observed in the buccal mucous membrane, the tongue, and the bulbar conjunctivas. A general pigmentation of the whole body is better marked in light-complexioned Eurasians. In native patients who are not carefully tended or washed the dry furfuraceous skin remains on and becomes in time dirty and black looking. This is most probably the darkening or blackness of the skin spoken of in connection with kala-azar."

Cancrum oris, inflammation, and ulceration of the gums and hard palate, and very occasionally suppuration tonsillitis were observed in a considerable proportion of the cases; four instances of suppuration of the middle ear were noted. "A very constant feature of the disease is edema of the feet; considerably more than half . . . suffered in this way. In the majority bronchitis was present. Among other affections of the lungs there were 12 cases with pleurisy with serous effusion, and 1 with hemothorax, and 2 had broncho-

pneumonia. There was rarely ascites; only 2 cases were recorded. In another there was a considerable amount of blood in the peritoneal cavity; this was detected before splenic puncture and therefore was not due to that operation."

Fatal Tendency of Piroplasmosis.—The records of piroplasmosis—so far as they have been registered up to the present—go to show that the disease when fully established carries with it a most grave prognosis. In Major Donovan's report, from which we have quoted, in the *Lancet* of September 10, 1904, we read that:

"As to the mortality, 22 died, 8 were removed moribund, and the remainder were discharged at their own request, invariably in a much worse condition than on admission—indeed, few of them had any prospect of surviving more than a month or two. The causes of death were: 6 from general infection, 1 from cancrum oris, 1 from edema of the glottis, 6 from diarrhea, 5 from peritonitis, 1 from bronchopneumonia, 1 from tubercle of the lungs, and 1 from hemorrhage after splenic puncture."

The revelations yielded by the autopsies were sufficiently vague: "The conditions found postmortem are generally an enlarged pigmented, or unpigmented spleen; the liver is enlarged, congested, or cirrhotic—at times there is pigmentation present; and the intestines, especially the large, are deeply congested, inflamed, or ulcerated."

With regard to other noteworthy clinical features, we are told that: "The blood examination in cases of piroplasma infection always shows a marked decrease of the red blood corpuscles; these vary from 2 to 2,000,000 in the cubic millimeter. There is no actual increase of the leukocytes, but a relative one of the mononuclears, much more marked than in malaria . . . the urine contains albumin and invariably pigment. Quinin has been given by the mouth, hypodermically, and intramuscularly *ad nauseam*, with no appreciable result. The same may be said of other less suitable drugs—*i. e.*, arsenic, sodium salicylate, carbolic acid, creasote, tincture of iodine, etc." Major Donovan tells us that from June 17, 1903, to June 16, 1904, there were 72 cases admitted into his wards suffering from this disease, all diagnosed by examination of blood from splenic puncture; the admissions for the same period have been 1,304, giving 5.52% . . . the deathrate has been 22, or 30.55% (but most of the others merely left the hospital to die elsewhere). The great importance of this native plague must accordingly be fully recognized. Europeans suffer but rarely. "The disease is equally common among poorer Mohammedans and Hindus; the Eurasians, being generally better housed, are not so often victims of the disease."

Identity of Kala-azar with Piroplasmosis.—Major Donovan had been struck with the resemblance of the clinical features of this disease, which he has thus so brilliantly elucidated, to those of the kala-azar or "black fever" of the Brahmaputra valley. This was also recognized by Major Ross. The kala-azar had previously elicited a goodly proportion of comment, without, however, the illumination of any light on the intimate nature of its exciting cause. The symptoms had been previously attributed by Giles to ankylostomiasis, by Ross and Rogers to malaria, by Bentley to Malta fever,

and by Manson to "a special as yet undiscovered parasite." The discoverer of the true pathologic agent is to be congratulated on his success—on the good fortune by which he at once added to his own reputation and to the sum of scientific knowledge. The profession of medicine has so rapidly expanded its borders of conquest during recent years that the juniors of the present day cannot well realize the comparative dimness of the twilight of scientific pathology in which the seniors of our own generation had to grope their way in the exploration of some of its most important and extensive domains. And a thorough knowledge of the ground occupied by the enemy, and of the nature of the weapons with which he effects his mischievous results, are the necessary preliminaries to his defeat and permanent dislodgment.

"*Texas Fever, the Original Bovine Piroplasmosis.*—As most readers, of course, already know, the bulk of existing knowledge of the genus *Piroplasma* in its parasitic existence has been gleaned from the investigations made into the nature of the so-called "Texas fever" of cattle. The phenomena of that variety of bovine disease were proved by Smith and Kilborn to be due to the presence of *Piroplasma bigeminum*. This parasite is introduced by the bite of a tick (*Boophilus bovis*), which also transfers it from one animal to another. It is also believed that the parasite is conveyed to the ova within the body of the female tick in some such way as to have the effect on the coming generation that the young tick as soon as developed is a genuine source of infection to any cattle that it may happen to bite. In what way the new body, the *Piroplasma donovani*, or "Leishman-Donovan body," is introduced into the human circulation has not yet been definitely determined. Indeed, the last word does not appear to have yet been said regarding the exact nature of the parasite. Even subsequent to the demonstration of the new body by Major Leishman to the British Medical Association at Oxford, in July of last year, Captain Leonard Rogers, I.M.S., stated that he had seen specimens develop into trypanosomes. Contradiction, however, tends, as we know, to brighten the intellect as well as the temper, and should not—having regard to the special shortcomings of human nature and human reason—be, under any circumstances, entirely discouraged.

Oldest Artificial Leg.—What is said by the *British Medical Journal* to be the oldest artificial leg in existence is now in the museum of the Royal College of Surgeons of England. It was found in a tomb at Capua, and is described in the catalog as follows: "Roman artificial leg; the artificial limb accurately represents the form of the leg; it is made with pieces of thin bronze, fastened by bronzed nails to a wooden core. Two iron bars, having holes at their free ends, are attached to the upper extremity of the bronze; a quadrilateral piece of iron, found near the position of the foot, is thought to have given strength to it. There is no trace of the foot and the wooden core had nearly crumbled away. The skeleton had its waist surrounded by a belt of sheet bronze edged with small rivets, probably used to fasten a leather lining. Three painted vases (red figures on a black ground) lay at the feet of the skeleton. The vases belong to a rather advanced period in the decline of art (about 300 years B. C.)."

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The value of a Malay's sworn testimony has again occupied considerable space in the lay press by reason of the twenty-year sentence inflicted in the Philippine Islands upon an American constabulary officer for an alleged unprovoked murder of a native. Incidentally attention has again been directed to the absence of a trial by jury, and the danger of being deprived of life itself by the decision of a single judge who, as in this case, may be a new arrival, presumably unaware of the remarkable inability of the Oriental to stick to the truth. In this case it is really a sentence of death, for no European or American can do manual labor in the Philippines for that length of time. A few have lived there longer, but they do not perform manual labor, and they carefully protect themselves from the climate. They do not subsist on prison fare and they take frequent excursions to cold climates. Should this prisoner become sick in prison with a disease requiring removal to a cooler climate, there is no provision for the change, and he must die unless promptly pardoned.

Malay treachery is apparently an important item in the case, and the accused knew infinitely more of the matter than the newly-arrived judge who tried him. The convicted officer is a cultured gentleman of good breeding, and has a gallant record, beginning at Santiago and extending through many trying situations in the Philippines in his chosen profession. He knew the treacherous nature of the native, and claims that he believed he was to be attacked with a bolo—so he shot in self-defense. The only witnesses were natives, who swore that the defendant was drunk and shot without any provocation, or at least in some pique at the action of a native policeman. It was long ago proved in India that natives would unhesitatingly swear falsely if they thought it to their interests, and it was an easy way of removing objectionable officials. This is possible also in the Philippines, and though in this case the evidence was so contradictory that it is not known exactly what

did occur, it is rumored that there was suspicion cast upon a native himself. It is a sad outcome to one who has devoted himself to our tropical interests, and it should direct renewed attention to the curious system we have built up in the Philippines, removing some of the safeguards protecting us from false accusations and depending upon testimony which could be impeached in any court at home.

Hysterical sympathy for the Filipino was worked up during the exciting times of anti-imperialism and produced a false impression of the race. The few brilliant half-castes who come here to be educated or to tour the country, perpetuate the impression and keep us in ignorance of the true Malay. With few exceptions, Americans go to the Philippines wholly ignorant of the psychology of the native. There is always a sad awakening in time, reminding us of the collapse of the sympathy for the lower class Cuban, when by actual contact we found out what he really was. To be safe from criticism, it might be wise to limit judicial appointments to those who had lived with the Malay for a year or two to get over the impression gathered at home. That there is some lack of confidence in the present system is evident from the fact that, as far as known, no American has ever been sentenced to death by a civil court in the Philippines. Brutal murders have occurred, no doubt, but no executions. If this is true, it shows that we are really afraid to carry the system to its fullest extent, and all murders will not be punished.

Trial by jury is again brought up. There would, no doubt, be a great outcry in the civilized world or the Anglosaxon part of it if a man were hung without a jury trial, and it is the part of wisdom to remedy the defect at once. The civil government of the Philippines is really a military government, for it would collapse were it not built upon some thousands of American soldiers. Remove them and no judge could execute a

decree or even hold court. A true civil government depends on the people themselves and the courts execute their will. In the Philippines the courts would close if they executed the Malay will. The system is fairly effective and life is safer from violence in their big cities than in our own, but in the outlying districts a pistol is a comfortable companion yet. If it is used too quickly it is dreadful, but there are hundreds of graves filled by boloed soldiers who did not shoot quickly enough. While not asserting that this present conviction is unjust, we are safe in saying that the system which takes this life is so bad as to taint the whole trial. We cannot safely break loose from the judicial procedures evolved after centuries of practice, and we already seem to look askance at the results.

The Hippocratic oath is printed on page 376 of this issue. Though venerable with age it is full of the spirit of the modern art of healing. The intervening 2,500 years have made no changes whatever in the purposes of the profession of medicine, and this ancient vow is, with modifications, what every true physician holds up as ideal. It is remarkable that the evils which afflict us are not modern at all, but evidently were burning questions in ancient Greece. The first paragraph was necessary by reason of the ancient methods of education and is of course obsolete, but its brotherly spirit should live on forever. Indeed, if we could infuse more of this spirit into the modern medical world the organization of the profession would follow as a matter of course. If no instruction were given to any except those who pledged themselves to right living by this oath, quackery in the ranks would die and the peruna scandals would never be heard of. The second paragraph, if now followed, would settle the proprietary medicine question, euthanasia, and abortion at one blow—matters which will probably bother physicians 2,500 years hence. The third paragraph is really more necessary now than ever.

Hippocrates was a priest physician, though he was the first to separate the two callings. If he did nothing else than to eliminate priestly incantations—the ancient Christian science—and insist upon treating disease rationally according to existing knowledge, he would still be the greatest known physician. Nevertheless he insists upon purity and holiness in personal life—an ideal which, if followed, would prevent the mutual incriminations so common. Perhaps religion and medicine have separated too far for their mutual good. He would leave surgery to those having special skill, and we doubt whether he would now demand a commission on the fee. The fourth paragraph, or the obligation to secrecy of confidential knowledge, is really a priestly

function, though it is now the unwritten or written law and does not need a vow. As a reward for keeping his oath, the ancient physician desired merely to enjoy life and his art and be honored among men—the modern cannot wish for more. He could not enjoy life unless he had the wherewithal; so that he expected to be paid according to his deserts, that goes without saying. The penalties for violation of the ethics of his calling—dishonor and no enjoyment of his life or art—are generally the natural results, but they should be universal. Every man must feel the better for even reading this ancient vow, and it would be well to memorize it—in college and later, too. The Hippocratic oath can be commended to those who look upon its modern form as the hypocritic code.

Proper physical types for the tropics are discussed by Dr. W. Hartigan¹ and some interesting generalizations are made bearing upon the question of anthropology. Of course, the best type for any climate is that which nature has put there, and if we do not know why, it is our place to find out. The negroes were not made black just for fun—in their native haunts they have an advantage which other types do not possess. As a rule, then, the nearer a man approaches the native in type, the more likely is he to resist climatic adversities. Hartigan says that wiry men of medium height, slight build, and even a bit under weight, if active and not nervous, seem to do as well as the big men and the gymnasts. He even casts some discredit upon the giants, who “run to blubber” in the end. Livingstone, Stanley, Johnston, and other tropical explorers, though gritty and energetic, were none of them very large. Lords Wolseley and Roberts would hardly pass a medical board—as they are so far below par physically. It is a tradition that the little fellows outlast the giants in India, and these new observations seem to show that the tradition is based on fact. There have been quite a few instances of physical or nervous breakdown of big, muscular Americans in the Philippines—the very men we would expect to last—while the types described by Hartigan have not been injured in the least. He says that the nerve tone of the big men is at a lower pitch, but a more sensible reason will be found when it is explained why tropical natives are generally slender and short—a few are tall in Northern India, but none are of the beefy German type. There is a great field for investigation, and it is desirable to have it worked over promptly. Physicians ought to know when to advise men to stay at home, for Hartigan mentions quite a number of blunders which merely sent unfit types to their death.

¹ Jour. Tropical Medicine, Jan. 15, 1906.

The failure of copper sulfate to sterilize cholera waters is reported from Manila by a correspondent in the *New York Medical Record*, December 30, 1905. The matter had evidently been taken up promptly by the sanitarians, who are said to have found that unless the salt were used in a strength of 1 part to 150,000 of water it did not destroy the vitality of the vibrios, and such a solution is, of course, unsafe for a public water-supply. This result could have been predicted from the experiments made in this country. Stokes and Thomas,¹ of Baltimore, have also investigated this point. Briefly, it might all be summarized by stating that to kill any of the water-borne pathogenic bacteria, copper sulfate must be used in a strength too great for potable water, and that if weaker solutions are used, the bacteria are either unaffected or are reduced in numbers in about the same degree as by a fair filter bed. As we have previously remarked (October 14, 1905) its only use is to destroy algæ, which give the fishy odor to good, pure waters, and that even here, though generally of great value, it sometimes fails. It has no practical use in sterilizing infected water, and even if it did accomplish this end, it would be a dangerous measure. It emphasizes the growing need of pure water-supplies, instead of the diluted sewage which seems to be the tippie civilized man is coming to the world over. We congratulate the Manila laboratories upon the promptness with which they have investigated the matter.

Pure water-supplies for large cities now seem impossible. The New York State Water-supply Commission has about come to the conclusion that in a short time it will not be possible to secure sufficient unoccupied land as a watershed to supply New York City, so that the Hudson river will eventually be used. Attention is therefore being directed to the criminal stupidity with which civilized men, here as in Europe, have been destroying their own water-supply by pouring sewage into it. It is the great problem of all dense populations. Thought is now being given to the possibility of prevention instead of removal of contamination. The general trend of opinion is already in the direction of compelling each community to dispose of its own sewage instead of passing it on to the next place down stream. Nevertheless, at the very outset, it is said, the New York Commission encounters a remarkable condition of public indifference. Many people are convinced that running water purifies itself in a few miles, and the rest do not care whether it does or not. The outlook is not encouraging, so that it is necessary to inaugurate a campaign of education. The cost will probably settle the matter. Unless the Hudson river is used, it will be

necessary to spend \$160,000,000 to establish a supply system in the Catskills, involving the removal of many communities and rendering huge tracts unproductive except for timber raising. Perhaps in time such forestry may be immensely profitable, if it is not mismanaged by public officials, and this is an enormous if. Beside, a congested population may demand the land to live on. It may not be possible to keep large areas uninhabited, and the indications seem to point to a return to nature, using natural streams for their drinking water and not as sewers. This is such a revolution that we cannot expect it in this generation. The cost of changing sewer systems already built may be prohibitive for a generation or two.

A military gynecologist has been highly praised by Dr. Joseph Taber Johnson,¹ of Washington, D. C., in an article describing pelvic massage. To be sure, Major Thure Brandt, a surgeon in the Swedish army, was primarily interested in physical culture, massage, and various movements which he popularized, but he found that he was remarkably successful in curing all kinds of adhesions and exudates not in an acute stage of inflammation. It was but a step to apply it to similar adhesions and exudates in the female pelvis. He met with instantaneous success. This was 25 years ago, and true to our traditional stupidity we are just taking it up. Johnson quotes about everyone worth quoting, apparently, and the testimony is all one way; everyone who has tried the method has relieved all sorts of malpositions, adhesions, and exudates which were ordinarily considered irremediable without operations of a serious nature. We can now expect the pendulum to swing away from what a famous neurologist denominated "uterine carpentry," for no one wants operations if massage will suffice. Yet it is not remarkable that this revolution should come from the work of a military surgeon, for our own army doctors have always been obstetricians. Civilian gynecologists should look to their laurels. We can commend the specialty to our National Guard surgeons in particular. There is an attractiveness about gold lace and brass buttons anyhow—or rather bronze buttons, to be strictly up to date—and the combination with Brandt's system of pelvic massage should be a winner with those poor sufferers who never mention their ills for fear of being hustled to a hospital before they can take second thought. Uterine tents and military tents are not so widely separated after all.

"The Boy and How to Help Him Succeed" is the title of a unique book by a unique man, Mr. Nathaniel C. Fowler, Jr., of Boston (Oakwood Publishing Company), who puts his ideas in condensed doses, reminding us of

¹ *American Medicine*, December 23, 1905.

¹ *New York Medical Journal*.

the proverbs of Solomon. It was published some years ago, but possesses timely interest from the increasing importance being attached to the environment in the cultivation of these young animals. It has been said that no intelligent father should fail to read Herbert Spencer's essay on education, yet that is a matter which is more or less out of the father's control. He is usually too busy providing the funds and is forced to delegate these parental duties to others. The question to be solved is the selection of the environment which is to make the most of what the boy is born with. The amount of literature on this one topic emphasizes our curious inability to remember our boyish feelings, thoughts, and impulses. Now and then a writer does remember them and the short stories written meet with instant success, for they touch up long buried memories which we instantly recognize. Yet it is a rare thing for a father to understand his own child's psychology and the little fellow is left to drift into manhood instead of being steered into it. The obstetrician and pediatricist might not be overstepping the bounds of propriety by referring to the matter now and then—perhaps recommending works on the psychology of childhood to keep old memories more on the surface. They would certainly aid the education of the boy. Nevertheless we must not expect too much—the individual must be studied. He cannot be made into more than he is, but he must not be allowed to be less—and that's the whole matter in a nutshell. Each unit must do the greatest amount of work of the kind of which it is capable. Unfortunately, boys often develop slowly and it is not known until late what they are to be and they are steered wrongly. Nevertheless it is well to have as many ideas on the subject as possible and each such book is one factor toward the up-building of a better civilization.

The climates of Alaska deserve a little professional attention on account of the remarkable reports of the healthy condition of our troops. The Secretary of War, in his last annual report, states that "Alaska has a remarkably healthy station for troops, all the rates being decidedly less than those for the United States proper." The report of the Surgeon-General shows that the Alaskan sickness was only two-thirds of that in the rest of the army, and but one-half of that in the tropics. What disease occurred seemed to be more severe, for the number of days each case was under treatment was longer than in the army at large, and the deathrate was exceeded by but two regions—around the Great Lakes and the Department of Colorado. This would seem to indicate that the people of Alaska do not suffer from the numerous small ailments which make up so much of the life of Americans. The explanation may be found in the fact

that Alaska resembles Scandinavia in many ways, and if the latter is the appropriate climate for certain types of men, so is Alaska. Indeed, we have so long looked upon the latter as a far-away Arctic region it is hard to believe that it has the same latitude practically as the Scandinavian peninsula. The coast of each is kept warmed by an ocean current from the tropics—Gulf Stream and Japanese current—and each has plenty of rains and clouds, long, dark winters and short summers. A Norwegian finds in Alaska the only spot in America which is identical in climatic conditions with his home, and he should be more healthy there than in any other place. As so many Americans incline toward the Baltic type in their physical make-up, it is quite evident why they should find health and comfort in Alaska. After leaving the coast region and traveling over the mountains, one, of course, reaches places resembling Lapland, where the type of men is different, but even here it is evident that white men are not so badly off as they are in Northern Africa or our Southern States. Indeed, there are quite likely to be unsuspected therapeutic virtues in Alaskan climates—for those nervous invalids who can afford it. A summer vacation there would not be a bad experiment by any means. It is regrettable that the expense in time and money places it beyond the reach of the most of them.

OATH OF HIPPOCRATES.

I swear by Apollo, the physician, by Æsculapius, by Hygeia, by Panacea, and by all the gods and goddesses, calling them to witness that according to my ability and judgment I will in every particular keep this, my oath and covenant: To regard him who teaches this art equally with my parents, to share my substance, and if he be in need, to relieve his necessities; to regard his offspring equally with my brethren; and to teach this art if they shall wish to learn it, without fee or stipulation; to impart a knowledge by precept, by lecture, and by every other mode of instruction to my sons, to the sons of my teacher, and to pupils who are bound by stipulation and oath, according to the law of medicine, but to no other.

I will use that regimen which, according to my ability and judgment shall be for the welfare of the sick, and I will refrain from that which shall be baneful and injurious. If any shall ask of me a drug to produce death, I will not give it, nor will I suggest such counsel. In like manner I will not give to a woman a destructive pessary.

With purity and holiness will I watch closely my life and my art. I will not cut a person who is suffering from a stone, but will give way to those who are practitioners in this work. Into whatever houses I shall enter, I will go to aid the sick, abstaining from every voluntary act of injustice and corruption, and from lasciviousness with women or men, free or slaves.

Whatever in the life of men I shall see or hear, my practice or without my practice, which should not be made public, this will I hold in silence, believing that such things should not be spoken.

While I keep this, my oath, inviolate and unbroken, may it be granted me to enjoy life and my art, forever honored by all men; but should I by transgression violate it, be mine the reverse.—[Translation by Edgar A. Emens, Syracuse University.]

AMERICAN NEWS AND NOTES

GENERAL.

Has Yellow Fever Second Time?—Robert Dale, a Trenton, N. J. man, who survived an attack of what was called yellow fever while in the army eight years ago, is reported again seriously ill with the disease in Ecuador.

Typhus Fever in Mexico.—Dr. Bernardo Jacoby, of New Orleans, has reached Mexico City to make a study of typhus fever. There have been 139 new cases since March 1, with 32 deaths. The sanitary campaign in the poorer quarters of the city is energetically prosecuted.

Vaccination of Postal Clerks.—The prevalence of chickenpox and smallpox during the past few winter seasons has brought to light an important oversight regarding the public health. A mail clerk was recently taken from his work with a suspicious eruption, and it was learned that there was no regulation in the postal service requiring employes to be vaccinated. Further inquiry discloses that it is the policy of the postal authorities not to interfere with public health matters, but to leave such details entirely to local Health Boards. It is possible that the widespread dissemination of smallpox during the last few years may have been assisted by infected mails.

A National Quarantine.—The Senate Committee on Public Health and National Quarantine has agreed to report favorably the Mallory national quarantine bill in an amended form. This is the bill which is designed to prevent the introduction of fever into the United States and it practically surrenders to the Surgeon-General to establish on one of the islands known as the Dry Tortugas, a quarantine station and anchorage of refuge for infected vessels having on board any person with yellow fever bound for a port of the United States. The Surgeon-General is required to establish quarantine stations with all necessary instrumentalities for disinfecting vessels and their cargoes and for the reception of the sick.

No Opium for Filipinos.—The President has sent to Congress the report of the Opium Commission appointed in 1904 to investigate the use of opium in the Philippines and to suggest means for its regulation, and a copy of a cablegram received from the Governor General of the Philippine Islands, at Manila, indicating that the opium bill was passed. The bill provides for the abolition of the opium traffic in accordance with the provisions of this act of Congress which prohibits the importation of opium in whatever form after March 1, 1908, except by the government and for medicinal purposes only and makes it unlawful at any time to sell opium to any native of the Philippine Islands except for medicinal purposes.

Deathrate Nil.—Though 540 patients were treated at the Free Hospital for Consumptives at White Haven during the year ending March 1, not one died of the disease. There were but two deaths, both of pneumonia, at the institution, one an employe and the other a female patient about to be discharged. The report showed that 114 patients were at the sanatorium on March 1, 1905, and 426 patients were committed during the year. The patients discharged during the year numbered 268, while those leaving numbered 134. On February 28, 133 persons remained at the sanatorium. Of the total number of cases treated, in 142 cases the disease was arrested, in 85 cases the condition of the patient was greatly improved, 83 patients were reported as improved, and 76 as not improved. During the year 165,820 quarts of milk were used and 281,766 eggs, at a cost of \$7,192.64 for milk and \$5,765.51 for eggs.

Yellow Fever Precautions.—The Treasury officials have taken measures to prevent a recurrence of the yellow fever epidemic in the Southern States. At the request of a committee of citizens from New Orleans, six surgeons have been designated to visit the parishes adjacent to that city to assist the State authorities in such measures as may be deemed necessary to prevent the introduction of yellow fever during the coming summer. With the same end in view, the department has designated nine public health and marine-hospital surgeons to go to the principal fruit-shipping cities of South and Central America to oversee the shipments from those ports. Inspection of fruit shipments, it is thought, will begin probably on March 15, or not later than April 1.

EASTERN STATES.

One House Has 18 Typhoid Victims.—A mysterious illness with which 18 young women living in the same boarding house and working in the same factory in Medway village (Mass.) were attacked recently, was diagnosed definitely by a Health Board agent as typhoid fever. The sickness developed two weeks ago, and was at first attributed to ptomain poisoning and later to the grip. One of the girls is dead, another is in a critical condition at the hospital, and seven others are considered dangerously sick.

NEW YORK AND VICINITY.

Harvey Society Course.—The thirteenth lecture will be delivered by Professor W. H. Howell, of Johns Hopkins University, at the New York Academy of Medicine, March 17 at 8.30 p.m. Subject: "The Cause of the Heart-beat." This is the last lecture of the series given during the past year.

To End Transfers of Dying.—Moved to emphatic action by a case reported to him, in which a woman dying from heart failure was hurried from New York Hospital to Bellevue and died in the ambulance on the way, the chairman of the board of coroners has taken measures to stop such procedures.

Diphtheria, according to Dr. Darlington, commissioner of health in New York City, is increasing at a rate to cause anxiety. There has also been an alarming increase of measles within the last thirteen weeks, the report for February of this year being 6,810 cases, against 901 of the same months last year. This, however, is not regarded with such seriousness as the spread of diphtheria.

A New Automobile Ambulance.—The Military Academy at West Point will have a new ambulance, a conversion of the familiar automobile express truck, equipped with the ambulance body, so that the electrically driven vehicle may be used in the transportation of those requiring the services of an ambulance. The medical department has a type of vehicle of this sort, intended for use in connection with field hospitals in time of war. This automobile ambulance will be tried under practical conditions, probably at Plattsburg, N. Y., in course of the mobilization operations of next summer.

PHILADELPHIA, PENNSYLVANIA, ETC.

Single Case of Smallpox.—A mild case of smallpox, the first to occur in Philadelphia for 18 months, was reported to the Board of Health last week. The patient said she had been at Cape Charles, Va., where the disease has appeared.

Darby Leads in Births and Deaths.—The official record of deaths and births in Delaware county for 1905 has just been made public. It shows that Darby leads all the other boroughs in the county both in births and deaths. Seventy-seven births and 80 deaths are recorded in the borough. Clifton comes second, with 52 births and 41 deaths. Lansdowne is third, with 48 births and 43 deaths.

Veterinarians Meet.—The Pennsylvania State Veterinary Medical Association held its annual meeting in Philadelphia last week. The reports of the county secretaries showed that rabies is prevalent, and in all cases where a person was bitten by a dog the Pasteur treatment was successful. Tuberculosis in cattle is still prevalent and forms a constant menace to human beings. There have been few cases of anthrax in the State.

Osteopaths Plead Again in New Jersey.—Osteopathy and the regular practitioners of medicine had their annual wrestle before the Assembly Committee on Public Health this week. For several years the osteopaths have had a bill introduced by Berg, of Hudson, providing for a State Board of Examiners to license them to practise in New Jersey. Advocates of the bill claimed that it was a distinct and effective change from the practice of medicine, especially in the use of drugs, and that it is entitled to recognition by the State.

The Widener Home for Crippled Children at York Road and Olney avenue, Philadelphia, erected at a cost of \$2,000,000 by P. A. B. Widener as a memorial to his wife, was opened on March 3. The institution comprises a set of magnificent buildings and a park of 35 acres, consisting of woodland, lake, and gardens. Dr. DeForest Willard, surgeon-in-chief of the institution, in his opening address announced that Mr. Widener had set aside a further sum of \$3,000,000 as an endowment fund for purposes of maintenance.

School Directors Sued.—State Health Commissioner Dixon, instituted criminal proceedings last week, before a Harrisburg alderman against school directors and other residents of Jackson township, Dauphin county, for conspiracy to prevent the enforcement of the school vaccination law. The alleged offenders are charged with having refused to obey the commissioner's instructions not to admit children not vaccinated to the public schools of the township. The defendants furnished bail for a hearing. This is the first of a series of suits to be brought by the State Health Department against violators of the vaccination law.

SOUTHERN STATES.

For Memorial to Major Walter Reed.—The executive committee of the Major Walter Reed fund has received \$1,000 from Andrew Carnegie and a like sum from Colonel Henry Lee Higginson, of Boston. It is desired to collect a fund of \$25,000, the income of which will be paid to Major Reed's widow and the principal be reserved for a permanent memorial to the discoverer of the yellow fever mosquito. The committee needs \$6,000 more, and hopes to secure that amount from the Southern States, which so far have not contributed.

Campaign Against Tuberculosis Among Federal Employees.—A campaign against the spread of tuberculosis among the employees of the Government in Washington was directed last week by President Roosevelt, who issued an order to the heads of all departments, giving them explicit instructions as to their duties in combating the disease. Printed copies of rules to prevent the spread of the disease are to be displayed in every Federal building, and nonobservance of the rules will be considered just cause for discharge. Sanitary inspections are also ordered.

Fumigation of Houses Where the Tuberculous Have Died.—Fumigation as a check against the spread of tuberculosis was authorized in Baltimore last week by the Board of Estimates. An appropriation of \$21,000 was allowed out of the contingent fund for this purpose. The fumigation will be under the direction of the health commissioner. Two wagons will be purchased and equipped with all the necessary apparatus. It is the intention to have fumigated, all houses in which

tuberculous patients have died. Houses from which patients have moved will also be fumigated before they can be again occupied. It is estimated that there are 2,500 houses to be fumigated.

Mortality for New Orleans for the Week Ending March 3.—General diseases 28, diseases of the nervous system and of the organs of sense 10, diseases of the circulatory system 17, diseases of the respiratory system 22, diseases of the digestive system 12, diseases of the genitourinary system 8, puerperal disease 1, malformation 1, diseases of infancy, 11, diseases of old age 5, external causes 13, causes ill defined 1. Total deaths, white 73, colored 57; total white and colored 130. Deaths in hospitals and other institutions 36. Deaths certified to by the Coroner 20. Deathrate per 1,000 per annum for the week, white 15.49, colored 33.68; total white and colored 20.30.

WESTERN STATES.

For an Epileptic Colony.—After being permitted to remain in abeyance for several years, the old agitation for the formation of a State epileptic colony in Illinois, where victims of the disorder may receive proper scientific treatment, has been taken up and is being vigorously urged by the reform committee of the Chicago Woman's Club. It is estimated there are 10,000 epileptic patients confined in the various insane asylums and poor farms of Illinois who now receive no skilled attention, and many of them might be cured by expert treatment. For a great portion of each year most of these epileptic patients are perfectly normal, and it is contended their detention in insane asylums works a great hardship on them and entails an economic loss to the State.

FOREIGN NEWS AND NOTES

GENERAL.

Urge Paper Handkerchiefs.—Several leading London physicians now are advocating the use of handkerchiefs made of paper. This is not only with the idea of combating the spread of tuberculosis, but other diseases. A linen handkerchief which is carried in the pocket and becomes heated is necessarily a disseminator of undesirable germs and, with the aid of laundries the constant circulation of microbes is kept up.

Breslau's Mosquito War.—The director of the Breslau, Germany, hygienic institute has announced the results of his mosquito-war experiments. The first object was to destroy egg-bearing females, which were found in large numbers in Breslau cellars. Fumigation was used, and the number falling on the papers placed on the floors often ran up to over 2,000 mosquitos. For destroying the larvas in pools of water, 50 grains of "larvicide" was put into a cubic meter of water and poured into the pool. This kills all the larvas within half an hour, but does not harm frogs and fish. To destroy the pupas is another question which will receive attention from now on. Breslau seems to be the first city in Europe to wage a systematic war against this plague, and other German cities suffering from mosquitos are preparing to imitate their plans.

OBITUARIES.

Charles A. Lindsley, aged 80, March 8, from heart trouble, at his home in New Haven, Conn. He was graduated from Yale Medical School in 1852. For many years he was Secretary of the Connecticut State Board of Health, and it was through his efforts that the health of the State was improved. He was attending physician of the Connecticut General Hospital, and President of the Connecticut Medical Society.

William H. McCormick, aged 80, March 6, at his home in Cumberland, Md. He was graduated from Jefferson Medical College in 1854. He had been a member of the National Medical Association, the Medico-Chirurgical Faculty of the State of Maryland, and the Tri-State Medical Association.

Elizabeth N. Bradley Bystrom, aged 54, March 9, at her home in Dobbs Ferry, N. Y. She was graduated from the University of France, Paris, in 1887. She was a member of the Academy of Medicine, the New York County Medical Association, and the Pathological and Neurological Societies.

Joseph A. Tipton, aged 69, March 5, at his home in Roanoke, Va. He was graduated from the New York University, New York City, in 1860. He served as surgeon in the Confederate army during the Civil war and was a member of the American Medical Association.

Charles W. Townsend, aged 37, March 7, of New York City, from an abscess on the brain, at the Hahne-mann Hospital, N. Y. He was graduated from the New York Homeopathic Medical College and Hospital, New York City, in 1893.

Edward W. Derby, aged 77, March 10, at his home in New York City. He was graduated from the New York University, New York City, in 1853, and had practised in New York City for over fifty years.

James Macdonald, aged 73, March 8, from heart disease, at his home in Boston, Mass. He was graduated from Harvard Medical School in 1864, and had practised for over forty years.

Frank J. Freel, aged 40, March 9, from typhoid pneumonia, at his home in Branford, Conn. He was graduated from the Long Island College Hospital, Brooklyn, N. Y., in 1891.

John B. Henion, aged 68, March 10, suddenly, at his home in Boston, Mass. He was graduated from the Eclectic Medical College of New York City, in 1883.

Charles Edward Prentiss, March 11, at his home in Middlebury, Vt. He was graduated from the Georgetown University, Washington, D. C.

David D. Richardson, March 6, at his home in Norristown, Pa. He was graduated from the University of Pennsylvania in 1871.

H. Lee Howison, aged 58, March 6, at his home in Bogata, Texas. He served in the Confederate army during the Civil war.

THE PUBLIC SERVICE

Changes in the Medical Corps of the U. S. Army for the week ended March 10, 1906:

Lieutenant-Colonel **DANIEL M. APPEL**, deputy surgeon-general, is relieved from duty in the Philippines Division, to take effect at such time as will enable him to comply with this order, and will proceed on the first available transport sailing from Manila, P. I., after April 27 to San Francisco, Cal., where he will report by telegraph to the military secretary of the army for further orders.—Major **PHILIP G. WALES**, surgeon, is relieved from duty in the Philippines Division, to take effect at such time as will enable him to comply with this order, and will proceed on the first available transport sailing from Manila, P. I., after July 1 to San Francisco, Cal., where he will report by telegraph to the military secretary of the army for further orders.—First Lieutenant **EUGENE R. WHITMORE**, assistant surgeon, is relieved from duty at Fort Jay, to take effect upon the expiration of his present leave, and will then proceed to Fort Warren for duty.—**REYNOLD M. KIRBY-SMITH**, assistant surgeon, is advanced from the grade of first lieutenant to that of captain, with rank as captain from February 28, 1906.—**PARK HOWELL**, assistant sur-

geon, is advanced from the grade of first lieutenant to that of captain, with rank as captain from March 3, 1906.

—**GEORGE C. DOUGLASS**, sergeant first class, now at the General Hospital, the Presidio of San Francisco, will report to the commanding officer, third squadron, second cavalry, that post, to accompany that command to Fort Snelling. Upon arrival at Fort Snelling he will report to the commanding officer for duty.—Major **FRANK R. KEEFER**, surgeon, having reported his arrival at San Francisco, Cal., will proceed to the Presidio of Monterey for duty.—**GEORGE C. DOUGLASS**, sergeant first class, now en route to Fort Snelling, upon arrival at that post will be sent at once to Fort Oglethorpe for duty.—Captain **HENRY PAGE**, assistant surgeon, upon arrival at San Francisco, Cal., will proceed to Fort Leavenworth and report to the commandant of the United States Military Prison at that place for duty, relieving Captain Jere B. Clayton, assistant surgeon, from temporary duty at the prison. Captain Clayton will rejoin his proper station.—Captain **JERE B. CLAYTON**, assistant surgeon, is granted leave for two months, to take effect upon his being relieved from duty at the United States Military Prison at Fort Leavenworth.—**FRANK T. WOODBURY**, assistant surgeon, is advanced from the grade of first lieutenant to that of captain, with rank as captain from March 6, 1906.—**JAY RALPH SHOOK**, assistant surgeon, is advanced from the grade of first lieutenant to that of captain, with rank of captain from March 6, 1906.—**WILLIAM E. VOSE**, assistant surgeon, is advanced from the grade of first lieutenant to that of captain, with rank as captain from March 6, 1906.—First Lieutenant **JOHN B. HUGGINS**, assistant surgeon, now at San Francisco, Cal., is assigned to duty in the army transport service, and will report to the medical superintendent of that service at San Francisco for duty.—Major **CHARLES F. KIEFFER**, surgeon, leave granted for ten days on surgeon's certificate is extended twenty days on surgeon's certificate.—**EMMETT C. KAUFFMAN**, sergeant first class, Fort Hancock, will be sent to Fort Andrews to relieve Sergeant Thomas F. Donovan. Sergeant Donovan will be sent to Fort Adams for duty.

Changes in the Medical Corps of the U. S. Navy for the week ended March 10, 1906:

R. W. PLUMMER, passed assistant surgeon, detached from the naval recruiting station, Kansas City, Mo., and ordered to the naval recruiting substation, St. Joseph, Mo.—**W. N. McDONELL**, assistant surgeon, ordered to the Yankton.—**L. H. SCHWERIN**, acting assistant surgeon, ordered to the Celtic.—**J. B. DENNIS**, surgeon, detached from the Naval Hospital, Pensacola, Fla., and ordered to the Naval Proving Grounds, Indian Head, Md.—**F. L. BENTON**, surgeon, detached from the Naval Hospital, Brooklyn, N. Y., and ordered to the Naval Hospital, Pensacola, Fla.

Changes in the Public Health and Marine-Hospital Service for the week ended March 7, 1906:

W. W. KING, passed assistant surgeon, directed to report to the director of the Hygienic Laboratory for temporary duty.—**W. K. WARD**, assistant surgeon, granted seven days' leave of absence from March 3, 1906.—**J. B. FOWLER**, acting assistant surgeon, granted one month leave of absence from March 31, 1906, and excused for a further period April 30, to June 30, 1906, without pay.—**J. G. GRACE**, acting assistant surgeon, granted leave of absence for one month from March 26, 1906, and excused from duty without pay April 26, to June 30, 1906.—**W. O. WETMORE**, acting assistant surgeon, granted four days' extension leave of absence from February 26, 1906.

Appointment.—Dr. **W. R. Brinckerhoff** was appointed Director of the Leprosy Investigation Station at Molokai, Territory of Hawaii, February 2, 1906.

Resignation.—**Mathias Walerius** resigned as pharmacist of the second class to take effect March 8, 1906.

SOCIETY REPORTS

THE SOUTHERN SURGICAL AND GYNECOLOGICAL ASSOCIATION.

Eighteenth Annual Meeting, Held in Louisville, Ky.,
December 12, 13, and 14, 1905.

[Specially reported for *American Medicine*.]

[Continued from page 343.]

Varicosity of the Saphenous Veins with Resulting Varicose Ulcer.—ROBERT CAROTHERS (Cincinnati, Ohio) mentioned the operations most commonly employed for the relief of this condition, and among them reference was made to the Schede operation, the Trendelenburg, but he said complete excision of the internal saphenous vein was undoubtedly the most satisfactory operation to be employed, but until the ingenious invention by Charles H. Mayo of two instruments which subcutaneously strip the vein, it was an operation requiring a long incision, tedious dissection, and considerable time for its performance. This operation, as advised by Mayo, was that after making a small incision in the upper third of the thigh over the saphenous vein, the vein was located, tied in two places, cut between the ligatures, and the distal end threaded into the enucleator, which was pushed under the skin along the course of the vein for about six to eight inches, where another small opening was made onto the instrument, the vein taken out, then the instrument drawn out from the first opening, rethreading the vein into the instrument, and again pushing it under the skin for another six or eight inches, another small incision onto the instrument allowing the vein to be drawn out, which was again ligated and removed. The lateral branches were torn off, and, as a rule, closed themselves. This operation was very quickly and easily performed, but was not without danger from hemorrhage or sepsis. He has twice done this operation and the immediate results were satisfactory. His cases were too new to say what would be the ultimate result. They were old cases with large troublesome ulcers treated by skin grafting. The patients were able to leave the hospital in less than three weeks, wearing an elastic porous bandage for support, and were now at the end of about eight weeks both at work as housewives. In one case in which there was a troublesome eczema, after an effort for one week to relieve the same, he again followed the advice of Mayo, sealing the eczematous area with compound tincture of benzoin until the skin wound had healed.

The Surgical Treatment of Floating Kidney; Postoperative Results.—FLOYD W. MCRAE (Atlanta, Georgia) argued for surgical intervention rather than attempted support by bandages or corsets, but urged careful selection of cases for operation and the recognition of correction of associated pathologic conditions. Especial attention was called to the frequent coincidence of floating kidney and chronic or recurring appendicitis. The author described a new muscle-splitting operation, delivery of the kidney, partial decapsulation, the making of a broad quadrilateral suspensory ligament by dissecting forward the fibrous capsule from near the hilum to beyond the convex border of the kidney. A mattress suture was put in each angle of the capsule, near the hilum, from which the suspensory ligament had been dissected, and including the reflected flap from either pole of the kidney. These sutures were passed deeply into muscles of the back, high up, so as to bring the kidney well into the hollow of the loin and close up to the twelfth rib. The quadrilateral suspensory ligament was next brought up between the separated muscles and held there by two silkwormgut sutures passed through all the structures from within out. A cigaret drain was placed between these sutures, and the remainder of the wound closed in layers with interrupted catgut sutures. Care was taken to avoid injury to iliohypogastric and

ilioinguinal nerves. The operation was illustrated by drawings. Twenty-two cases were reported.

[To be continued.]

WESTERN SURGICAL AND GYNECOLOGICAL ASSOCIATION.

Fifteenth Annual Meeting, Held in Kansas City, Mo.,
December 28 and 29, 1905.

[Specially reported for *American Medicine*.]

[Continued from page 344.]

The Effects of Osmic Acid Injections.—JOSEPH RILUS EASTMAN (Indianapolis, Ind.) said the injection of ten drops of osmic acid in a two percent solution into sensory nerve trunks is safe. The likelihood of irritation of the kidney, however, should not be forgotten in cases exhibiting kidney lesions. Injections into the inferior dental or other nerves should not be made through the mouth, since infection of the wound and necrosis may result, with consequent failure in the action of the acid. Immediate relief should not always be expected, notwithstanding the cases of Bennett and Murphy were all immediately relieved. No one of the writer's cases, even those in which the acid was accurately injected into the nerve trunks and into the perineural fat, was promptly relieved, relief coming in from one to two weeks. The observations on this point of Wright, who had a large experience with osmic acid injections, corresponded to those of the writer. There was very little doubt but that the stretching of the nerve trunk necessarily incident to the injection is productive of good, supplementing, as it did, the action of the acid. There was no good reason why the stretching should intentionally be avoided, except perhaps for experimentation. In the case of small nerves, it would be found exceedingly difficult to inject directly into the nerve trunk, that is, the needle eye would pass to the distal side of the thread-like nerve, or perhaps not enter the nerve substance at all, or, notwithstanding the utmost care be used, the fibers may be so teased apart by the needle point that the fluid will simply be spilt about the nerve. In such a case, in order to bring the acid in contact with all of the fibers, it was wise to clip the nerve so that the end may be bathed in the fluids. The effect of manipulation of the nerve, as by stretching, had not as yet been eliminated as a possible aid to the chemical action of osmic acid; therefore a general anesthetic should be administered so that neurotomy, or section of the nerve, may be practised, if desired. The writer's experiments had shown no other changes in the nerve tissues as the result of injections of osmic acid than the disintegration of fat and oil globules in the perineural space and in the white matter of Schwann, such white matter of Schwann being simply fatty matter in a fluid state, insulating and protecting the essential part of the nerve. The degenerations appearing in the nerve itself were only such as may be fairly attributed to nutritional changes and exposure, the indirect result of the selective action of osmic acid of destroying fat. There was no reason why this fat should not be restored and the nerve again become capable of transmitting sensation; that is, theoretically the neuralgia might return after injection of osmic acid. Osmic acid injections were uncertain in effect as to the cure or relief of neuralgia. A large percentage of cases of neuralgia would be relieved for months by osmic acid injections. The injection of osmic acid for the relief of tic douloureux was quite justifiable, even if it should become necessary to repeat the injections at intervals of a few months, particularly in view of the unfavorable results of the so-called radical operation. The local irritation produced by the acid and the remote toxic and irritant effects were not serious in their consequences, and had no meaning as to the effect of the osmic acid in relieving neuralgia. The solution of osmic acid should be made fresh for each operation, as deterioration was rapid.

[To be continued.]

CLINICAL NOTES AND CORRESPONDENCE

[Communications are invited for this Department. The Editor is not responsible for the views advanced by any contributor.]

THE FINAL ERADICATION OF TUBERCULOSIS.

BY

NORMAN ROBERTS, M.D.,

of Fort Stanton, N. M.

U. S. Sanatorium for Consumptive Seamen.

Sometimes it is well to look into the future in order that present action may be directed aright. I will endeavor to show by this process along what lines we should direct our energies in the campaign against tuberculosis. I know well that the ultimate measures which I shall propose are impracticable today, yet I venture to say that before many years the problem will be solved in the manner indicated.

To my mind, he who by wilfully violating the laws of health contracts a fatal disease, is morally guilty of suicide; and when in addition he spreads this disease to others, he is morally guilty of murder. The majority of the tuberculous belong to a greater or less degree in this culpable class; and, not as a punishment, but as a means of limiting the results of their wrongdoing, these persons should be, for the time being, deprived of their liberty in order that the transmission of the disease may be checked and that the patients themselves may have the best possible chance of cure and of restoration to their original usefulness.

A minority of the tuberculous contract the disease as a result, principally, of causes beyond their control. Some of these causes are infection in early youth, unusual and perhaps unconscious susceptibility, the ingestion of an extraordinary number of virulent bacilli (an accident not unlikely to happen in these days of lack of sanitary system), and, most important, the combination of poverty, drudgery, and filth from which there is no escape for an entire tenth of the population. This minority forms the class of unfortunate victims who also should be deprived of their liberty until they have recovered their health and are no longer a menace to others. It is no use to try and distinguish between the culpable and the unfortunate, for the reason that punishment or special consideration of any kind would be detrimental to the best interests of all concerned. There is only one way to handle the two classes, for every case presents the two elements, culpability and misfortune in such complex combination that it would be impossible, even if it were not useless, to try and analyze them. The question is not "why?" but "what now?" not "how did it happen?" but "what shall we do?" What we have done, while it has been of great value in enabling us to find the proper course, has not been the proper course. We have indeed effected some reduction in the deathrate; but much further reduction is not possible under the present system, whereas every sanitarian knows that the disease could easily be reduced to next to nothing in a few years, and kept down to insignificant proportions forever after, if some capable sanitary general had but the necessary authority and resources.

It seems to me that the way to exterminate this disease is to adopt the same measures that have been successful in reducing almost to zero the other great plagues which formerly ravaged the race. Isolation, disinfection, and sanitation in general have, in civilized countries, practically banished from the list of causes of death such diseases as plague, typhus fever, and cholera, and the same measures suitably applied would do the same for tuberculosis but for the fact that public opinion, in its cheap sympathy for the whims of the tuberculous and in its heartless and penny-wise-pound-foolish refusal to pro-

vide for his real needs, will not sanction the application of scientific methods for his care and for the eradication of the disease.

The term "cheap sympathy" aptly expresses the attitude which public opinion has all along held toward the tuberculous. We hate to worry the poor sufferer with sanitary ordinances, so we look the other way when he coughs and spits and we meekly swallow his dried bacilli the next day; but we howl down any proposed legislation that would mean our paying for his spittups. We lie to him (or neglect to examine him thoroughly) when he consults us professionally about his "bronchitis," "malaria," or "dyspepsia," but it would be expecting altogether too much for us to surrender to a government bureau enough authority and money to put him where he would do no harm to his friends and where he would have a chance for his own life. We read with righteous indignation of the cruel refusal of a hotel man to allow his place to become infected by harboring a dying tuberculous subject half way across the continent from home; but we forget that we are living under a government that is supposed to be civilized and that it is the duty of the authorities, not of hotel men, to care for those who are unable longer to care for themselves. In short, we are willing to let the tuberculous do or have anything he wants with entire disregard of its effect on the general welfare so long as we individually as citizens are not asked to contribute anything for his benefit.

Fortunately, there are signs of a change for the better in this attitude. We are still disgracefully cheap, but we are not so hypocritically sympathetic. We are beginning to say to the tuberculous, "*you* are the one to stop the spread of tuberculosis. If *you* would stop spitting around promiscuously the rest of us would be safe, but so long as *you* do this the deaths will continue. Now stop it." This attitude is a great improvement over the other and has resulted in the saving of many lives; but we are going to be disappointed if we expect to *eradicate* the disease by any method based on the principle of prohibition. The trouble with prohibition in any form is that it shifts the whole task of the prevention of evil (whether of disease or of vice) onto the shoulders of the weak and the indifferent. One who gets pulmonary tuberculosis proves thereby that he was unable or unwilling to take proper care of himself even when well. When sick he is naturally still less able and responsible, and yet the prohibitionists expect great results from burdening his sinking shoulders with the additional duties of voluntary sanitary policeman without even giving him free spittups!

Cooperation has of late years proved to be a great force for good in many fields; and nowhere has it an opportunity for more revolutionary improvement of existing conditions than in the treatment of pulmonary tuberculosis. Under competition each member of society does what he *must* in order to hold his place or forge ahead. Under cooperation each does what he best can for the general good. Under competition the tuberculous individual works until he drops, or goes with his family to the poorhouse. No attention is paid to him so long as he does his work, and as a result he dies, after scattering infection among his associates for months or years. That is to say, in the case of the tuberculous the competitive system makes it necessary that he do the thing he is least able to do, namely, work, and forces him wholly or partly to neglect the vitally important things that he alone can do: that is, to nurse himself to recovery and to guard his expectoration to prevent the infection from spreading. Cooperation between the tuberculous and the authorities would exactly reverse all this, to the incalculable benefit both of the sick and of the well. The tuberculous subject does his full duty when he obliterates himself as a source of infection by either recovery or death, and keeps himself harmless to the rest of the community while sick by taking proper

care of his sputum. No one but himself can do these things, and, so long as he has the disease, these and these only should occupy his entire attention. The rest of the problem properly belongs to the community; and the community, if it does its duty, will see that the tuberculous person is relieved of all other responsibility; it will see that he is so placed that the infection of the well is an impossibility; and it will see that the sick have the best opportunities obtainable for recovery or for the easiest possible death.

How is this to be accomplished? Evidently the chief requisite is, that in every recognizable case of pulmonary tuberculosis the patient should be subject to official orders as to residence and occupation; hence, private philanthropy, while cheap so far as the public treasury is concerned, lacks the one thing necessary to efficiency. Private philanthropy and the individual efforts of private practitioners have indeed accomplished great good in reducing the sufferings of the tuberculous individual, and, to a limited extent, in reducing the number of cases; but such agencies will never rid the country of pulmonary tuberculosis. Is it possible to rid the country of pulmonary tuberculosis? Undoubtedly, if we go about it in the right way. The army cleaned yellow fever out of Cuba within a year, and it has never come back. The eradication of tuberculosis would, from the nature of the disease, be a more tedious undertaking; but with the right kind of public support the national public health service could within ten years reduce the national annual deathrate from tuberculosis to less than 1% of the present figures; and ultimately this disease, instead of being, as now, endemic and responsible for one-seventh of all deaths, would be represented by a few carefully-guarded cases, mostly imported, the deathrate cutting no figure in the total.

But the eradication of pulmonary tuberculosis, while simple in principle, will be by no means simple or easy of execution. Haste must be made very slowly and carefully and public opinion educated simultaneously out of its cynical disbelief in great national undertakings, its hypocritical sympathy, and its expensive cheapness. Beginning in the large cities with compulsory notification, we must have in succession municipal aid for the tuberculous individual, sanitary inspection of dwellings, segregation of the tuberculous and their families within restricted geographic limits where close sanitary supervision can be maintained, deportation of suitable cases to tuberculosis colonies in the arid southwest, forcible removal when necessary, destruction of infected buildings and reconstruction along sanitary lines of slum districts, and supervision of food supply. When this system has been in successful operation under several large city governments it should be extended to States, and finally should be consolidated under a national organization. A national organization would represent the maximum both of efficiency and economy; in fact, the final running of the game to its last stand—the final extinction of the disease which will require such unity of purpose and such close concert of effort that nothing short of a national, or perhaps even of an international health service will be able to deal with it.

The measures proposed are by no means limited in usefulness to the prevention of tuberculosis. With suitable modifications they would be effectual in eradicating or reducing in frequency all communicable diseases. It is the doctor's duty to open the eyes of the public on these matters and it is to the individual and collective interest of the profession to do so, for the broadened field of usefulness thus opened to the profession will result in the increased personal comfort of every member; whereas if the doctor, with shortsighted indifference and selfishness, waits for lay public opinion to take the lead in these reforms, the profession will get much less consideration when the reforms come. By confining its attention almost entirely to private practice and neglecting to cultivate its other possible fields of usefulness the profes-

sion has not only cut itself off from large emoluments, but it has reduced the productiveness even of private practice; and the exorbitant scale of fees "necessary to maintain the dignity of the profession" is practically the sole reason for existence of the free dispensary, the advertising quack, and the patent medicine man and causes a net loss to the profession of millions of dollars annually.

Cooperation on the large scale is no longer a dream of visionaries. Its usefulness is no longer confined to politics, business, and fighting. It is spreading to every department of human endeavor. Medicine has stood out against it longer than any other of the great professions, but even the doctors are beginning to throw up their hands and to confess their inability to go it alone much further. In the course of time the bulk of the nation's medical work will be done by an organized body or bodies of physicians paid from the public treasuries, just as the bulk of the nation's schoolteaching has passed into the hands of the public school system; but to come back to the immediate future, cooperation on the largest and best organized possible scale is indispensable if tuberculosis is to be eradicated.

LIGAMENTUM NEPHROCOLICUM.

BY

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of Detroit, Mich.

To the Editor of American Medicine:—I note in your issue of January 6 a communication from Dr. Byron Robinson in which he suggests that in the description of my *nephrocolic ligament* I am "trying to describe" a peritoneal fold which he has named the "*ligamentum phrenicolicum dextrum*."

I feel certain that Dr. Robinson could not have read my article previous to writing his criticism, as nowhere in it do I refer to the ligament as being composed, in whole or in part, of peritoneal tissue, but state distinctly that it is formed by the prolongation downward of longitudinal fibers from the framework of the fatty capsule of the kidney.

The following quotation from my paper ("*A Study of the Etiology of Floating Kidney, with Suggestions Changing the Operative Technic of Nephropexy*") will, I think, convince Dr. Robinson that I am not poaching on his preserves:

"Further investigation was made on the cadaver, the dissection being as follows: The whole upper half of the abdominal parietes being incised and turned downward, the cecum, ascending colon, with hepatic flexure and kidney on the right side, and part of the descending colon with splenic flexure and kidney on the left side, were removed, the dissection being made from below upward and the organs removed together in such a manner as not to interfere with their normal attachments to each other. On turning the specimens over, the posterior surface of bowel and kidney of each side showed a similar formation of tendinous attachment to each other. This was found to be formed by the gathering together of fine longitudinal fibers from the fibrous network which forms the framework of the fatty capsule. The tendinous ridge, formed by its attachment to the posterior surface of the ascending colon, could be followed easily between the peritoneal reflections down to the margin of the lower peritoneal attachment of the bowel and close to the junction of the ileum—in fact, near the point of the so-called origin, in the female subject, of the suspensory ligament of the ovary. This ligamentous continuation of the framework of the fatty capsule is probably the tissue left in the track of the ovary or testicle in its descent from its place of origin in the wolffian body high up near the kidney."

¹ Amer. Jour. Obstet., Vol. llii, No. 5, 1905.

ORIGINAL ARTICLES

WITHOUT MOSQUITOS THERE CAN BE NO YELLOW FEVER.¹

BY

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It seems incredible, but is nevertheless true, that there are still in the United States at the present time many physicians who oppose the idea that the mosquito is the sole means by which yellow fever is carried from one person to another. They refuse to believe that the natural disease cannot be contracted in any other way than through the bite of the mosquito. The fact, however, has been repeatedly demonstrated and the evidence in its support has now become overwhelming. The tremendous importance of this subject, in a city which by reason of her location and commercial intercourse with Central and South America, may be regarded as the gateway through which a disastrous epidemic may at any time be introduced into the United States, is my apology for again taking up so trite a subject. It is the duty of those who are familiar with the facts to communicate them to the members of the profession, for the people must rely upon their physicians in all matters pertaining to the preservation of health and the prevention of disease. We cannot expect that the active practising physician shall keep abreast of all modern advances in scientific medicine, and the numerous contradictory statements that have been made in regard to yellow fever have afforded full justification for scepticism on the part of those who aim to be conservative. While strong conservatism is to be commended, persistent scepticism is to be condemned. It is perfectly justifiable to refuse to receive statements that revolutionize our accepted ideas, so long as they are based upon the assertions of a single observer or a single set of observers, but when these observations have been confirmed by competent unbiased persons in different parts of the world, such statements must then be accepted as facts, just as we accept other statements in regard to history, geography, and the sciences in general.

It is well known that a number of disease-producing animal parasites are never found in nature outside the body of a living host. They pass their whole existence first in one animal and then in another, alternately, being carried to and fro by means of biting insects, by the ingestion of infected food, etc. It is only necessary to consider here the group of parasites that is transmitted by the blood-sucking insects, such as the tick and the mosquito, the latter in particular. We know that the Texas fever of cattle is caused by an exceedingly minute

microscopic parasite which spends its whole existence in bovines and in the tick. If cattle are kept free from ticks they cannot contract the fever. Furthermore, the tick is now accused, and with good reason, of being the transmitter of relapsing fever. It is equally well known and proved beyond question that the mosquito transmits filarial infection and malarial fever to man. No one would think of asserting in print today that malaria is contracted through exposure to night air, to unhygienic surroundings or by drinking the filthiest water, for such statements would be justly characterized as absurd. The renowned experiments of Sambon and Low in Italy, in 1900, showed conclusively that persons can live in the most pestiferous malarial regions and retain perfect health, so long as they protect themselves against the bites of mosquitos. In the same year these observers shipped living malaria-infected mosquitos from Italy to England, where they were applied to two persons in perfect health in a region where malarial fever is unknown. Within a short time both of them suffered typical attacks of malaria, during which the parasites were frequently demonstrated in their blood. Fortunately the various stages in the development of the malarial parasite in man and in the mosquito can be demonstrated with the microscope. We know that the phases it passes through in the insect are entirely different from its cycle of development in man, and no one has as yet succeeded in demonstrating the existence of this parasite elsewhere than in a living host. Such a demonstration is not necessary, for with our present knowledge we can explain all the known facts relating to the contraction and dissemination of the disease and we can insure absolute protection against it. We no longer attribute malarial infection to the inhalation of gaseous poisons emanating from swamps in the night time, or to bad water. We know that swampy places simply furnish breeding grounds for the malaria-carrying mosquito, which flies at night, and whose bite is necessary for the contraction of the fever. The insect must previously have bitten a person suffering with malaria, and an interval of at least a week must have elapsed, otherwise no infection can result. The recent brilliant discovery by Koch, that apparently healthy negro children in the pestilential districts of Africa constantly carry large numbers of malarial parasites in their blood, explains the source from which the mosquitos obtain these parasites; it also explains the relative immunity against this infection enjoyed by the negro.

If we now consider the numerous points of similarity between malaria and yellow fever they will be found to be very striking. Both are diseases of low-lying districts; both infections are contracted chiefly at night; both may be conveyed by direct inoculation of the blood of a patient; both are most prevalent in the places and seasons where and when mosquitos are most numerous; both infections are impossible after severe frosts, which cause

¹Read before the American Association for the Advancement of Science at the New Orleans Convention, December 29, 1905, to January 4, 1906.

the mosquitos to hibernate. These constitute strong points of resemblance between the two diseases, which differ from one another in that the duration of yellow fever is very short, while malarial infection may persist for years. Unfortunately the parasite of yellow fever has never been found, in spite of claims to the contrary, and notwithstanding the use of the best powers of the microscope, and even the ultramicroscope, in the efforts of skilled observers to discover it. That there is a yellow fever parasite we feel assured, because it is not possible to explain the continuous propagation of the disease upon any other hypothesis, and apart from its invisibility, the manifestations of its presence are in complete accord with the behavior of parasites that are well known. We must not forget that the minimal limits of creation in nature may be beyond our conception, and we must be prepared to learn, if necessary, that there are living bodies too minute to be defined with our present instruments.

The report of the latest scientific investigation of this disease by Otto and Neumann¹ of Hamburg, members of the German Commission, working in Rio de Janeiro within the past year, states that they were totally unable to find anything either in the blood or cerebrospinal fluid of patients suffering with yellow fever that could not be found in similar material obtained from persons suffering with other diseases and from persons in good health. In this work they used the ultramicroscope of Siedentopf and Zsigmondy. Neither could they find anything in the infected mosquito after dissecting it in the fresh state, nor after hardening and sectioning it, that they felt justified in regarding as the cause of the disease.

How then are we to explain this failure to discover a parasite in a disease, apparently of parasitic origin? And, if a parasite be present, to what class does it belong? It seems quite rational to exclude it from among the bacteria because, (1) it has never been cultivated nor stained by any of our known methods. (2) The work of Marchoux, Salimbeni and Simond has shown that the blood of a patient after its withdrawal loses its power to infect within two days, if kept exposed to the air, and within five days if air be excluded. (3) The disease has been shown to be absolutely noncontagious in regions where *Stegomyia fasciata* is not present, *p. e.*, in Petropolis near Rio de Janeiro. (4) We know no bacteria that live in the tissues of animals, as the yellow fever organism does in the mosquito, for months, as a harmless parasite. The logical conclusion, therefore, would seem to be that the parasite of yellow fever belongs to the animal kingdom, because, (1) it is absolutely necessary for its continued existence that it pass alternately through man and the mosquito, and its parasitic existence in these hosts is obligatory. (2) The

fact that a period of about two weeks or more must elapse before the contaminated mosquito is capable of infecting, points to a definite cycle of development in that insect. (3) The limitation of its developmental cycle to mosquitos of a single genus, and to a single vertebrate, conforms to a natural zoologic law and does not agree with our present knowledge of the life history of bacteria. (4) The effects of climate and temperature upon *Stegomyia*, and upon the rate of development of the yellow fever parasite within the body of the insect, are exactly the same as the effects of the same conditions upon the *Anopheles* mosquito and the malarial parasite.

Consequently, although on account of its minute size no one has ever been able to identify the organism of yellow fever either in human blood or tissues, or in the mosquito, we feel justified in regarding it as an obligate animal parasite. If this be correct it cannot maintain its vitality in water, in soil, nor in any other material, no matter how badly they may chance to have been contaminated. Experience and experiments have shown that such is actually the case; that dead bodies can be freely handled and dissected by nonimmunes without danger; that nonimmune persons may live in intimate contact with the garments, bedding, and clothing used and soiled by yellow fever patients, under the same conditions and in the same climate where yellow fever has prevailed, and suffer no inconvenience. And further, it has been shown by the French Commission that this organism fails to survive in blood, a most excellent culture medium, after it has been kept for 48 hours under ordinary conditions. This undoubtedly proves the inability of the organism to maintain its vitality in filth or decomposing organic matter.

Yellow fever is noncontagious, for in our medical literature numerous instances are recorded in which numbers of patients were brought to certain places for treatment and no secondary cases resulted. This was before the days of disinfection, before any precautions were taken against mosquitos, and at a time when intercourse with the sick was free and unrestricted. These strange occurrences were observed in Spain during a severe epidemic at Barcelona in 1821, during which, under the supposition that the air of the city was infected, there was a general exodus to the country. Here hundreds came down with the disease and were treated, but not a single case was recorded to have appeared in a person who had not visited the city. Yet tons of furniture and baggage were carried from infected houses into the country. All this took place in a warm climate and during the ravages of a devastating epidemic. Such remarkable occurrences were inexplicable mysteries that puzzled the most brilliant medical minds of the day; they could only be explained upon the theory that the air of the city had become contaminated. And so it had, but not with poisonous gases and noxious vapors as they supposed, but with infected mosquitos. In the light of

¹M. Otto and R. O. Neumann: *Zeitschrift f. Hygiene u. Infektionskrankheiten*, II, 3, November, 1905.

the mosquito theory the explanation is clear. An epidemic prevailed in Havana during the early part of that season, and a number of cases appeared on vessels after leaving there for the Spanish port, where the epidemic appeared later in the season. The first cases in Barcelona were seen on the vessels from Havana, lying in the harbor; then persons living in the city, but who had visited and were employed on the vessels, were taken sick; and later, the epidemic raged throughout various parts of the city. It is quite evident that the vessels carried infected mosquitos as well as others that were not infected; these mosquitos bred rapidly in the houses on shore and the conditions then became ripe for a rapid extension of the disease after the introduction of a few cases. It is to be noted that vessels were constantly arriving from Havana; cases appeared on the ships during the voyage, and, until suspicion was aroused, patients from the vessels were treated on shore. The *Stegomyia* introduced from the vessels being house mosquitos, remained in the city, while the country districts were free from them, and for that reason free from any extension of the fever. The absence of the proper mosquito is the only explanation that can be offered, and in the light of our present knowledge, it is all sufficient.

In the United States, both before and since the epidemic at Barcelona, there have been similar outbreaks, always introduced by importation, though frequently regarded as of endemic origin, *p. e.*, at Philadelphia, Baltimore, Norfolk, and New Orleans. In the latter city the danger is particularly great, because *Stegomyia* being always present, will readily spread the infection if it encounter a sufficient number of nonimmunes.

Another good case in point is Petropolis, 25 miles from Rio de Janeiro and at an elevation of 3,000 feet. Yellow fever is never known to occur there, spontaneously, and for that reason it has been made the home of nonimmunes who spend the night at Petropolis and visit Rio during the day for the transaction of business. While there are no *Stegomyia* at Petropolis, the French Commission showed three years ago that the disease can be produced there by inoculation with infected insects. One who seeks can find abundant evidence at the present day to show not only that the mosquito transmits yellow fever, but that without the agency of the mosquito it is impossible to have yellow fever, except by means of experimental inoculations.

Since the first demonstration of the mosquito theory by the Army Board in 1900, confirmatory experiments have been made by Dr. John Guiteras of Havana; Ribas and Lutz of Brazil; the French Commission from the Pasteur Institute; Working Parties No. 1 and No. 2 of the U. S. Public Health and Marine-Hospital Service; and lastly the German Commission from Hamburg, admit no other possibility. The latter, whose report was published only two months ago, lay great stress upon the necessity for the extermination of mosquitos in locali-

ties where yellow fever appears in epidemic form, because, they say, without the mosquito, extension of the disease is impossible. They advocate complete extermination of the insect, and speak with enthusiasm of the success that has been attained in Rio, in spite of the opposition of a number of local physicians and of a rather large proportion of the population. As a result of their observations in Rio, they maintain positively that the natural form of yellow fever can be contracted only through the bite of an infected mosquito of the genus *Stegomyia*; they are so firmly convinced of this fact that they decline to consider the possibility of any other mode of infection, since they could find no evidence in support of it. They found the yellow fever mosquito everywhere in the city of Rio, but in Petropolis, where the French Commission before them could not find it and where yellow fever is known never to spread, they failed to discover a single specimen. If one could say the same of New Orleans another outbreak of yellow fever there would be an impossibility, except when the mosquito as well as cases had been introduced. According to Otto and Neumann,¹ the authorities in Rio are about to adopt the admirable system of providing a mosquito proof barrack for laborers in the harbor and docks, and they will keep the men under medical supervision, in order that any cases occurring among them may be protected at once from mosquitos. This will insure that no secondary cases shall be produced by infection from them. They urge the necessity for protecting patients from mosquitos during the first three or four days of the fever, because it is only during this period that the mosquito can acquire the infection from them. They state emphatically that in combating an epidemic all preventive measures should be directed against this insect and its relation to the patient. After proper protection of the patient all suspected mosquitos must be destroyed, and efforts should then be made to exterminate all *Stegomyia* present in the locality, if possible.

Under the efficient management of the Director of Public Health, Doctor Oswald Cruz, who is himself an experienced scientist, over \$65,000 per month were expended in Rio de Janeiro, from April to December, 1903, in the war against mosquitos. Even the main sewers were fumigated and myriads of mosquitos destroyed in them by the use of sulfurous acid. A sanitary brigade was organized and divided into sections for operation in the different districts into which the city was divided. The personnel of this brigade comprised about 2,000 men, including 80 physicians. Their duties were specifically defined as "(1) the isolation of yellow fever patients and their protection from mosquitos, including the necessary arrangement of the isolation rooms; (2) the destruction of mosquitos in the house and its surroundings and the destruction also of their breeding places; (3) the removal of the patient in a screened conveyance

¹ The German Commission.

from his home to the hospital, if he desired it, or if it were impossible to isolate him in the house and the public interest demanded it." In all suspicious cases the patients were treated as though they had yellow fever and halfway measures were not tolerated.

A manifesto setting forth the relation of the mosquito to the disease and the necessity for the measures instituted was published on April 26, 1903, for the instruction of the people, and I cannot do better than cite a few extracts from it to show the positive conviction of those in authority, who had already witnessed the confirmatory experimental work of the French and Brazilian Commissions.

EXTRACTS FROM THE MANIFESTO.¹

* * * * *

2. Yellow fever is not conveyed from person to person, nor is it transmitted by means of soil, or articles used during illness, the sole means of transmission is by the mosquito, as has been fully determined.

3. Several days after biting a case of yellow fever the mosquito acquires the power to transmit the disease, and it preserves that power for some time, two and one-half months or more. The domestic habits of the mosquito explain sufficiently why yellow fever is a disease that establishes itself in houses and why it is contracted only in cities.

* * * * *

8. During epidemics, when the disease is at hand, all healthy persons should have mosquito nets upon their beds at night, and they should take care not to be bitten by mosquitos during the day, because yellow fever mosquitos bite also in the day time.

The new harbor regulations for vessels entering with yellow fever on board are in part as follows:²

a. The sick are immediately removed and isolated with mosquito netting.

b. The mosquitos in the entire vessel are killed systematically and their breeding places are destroyed.

c. Passengers who intend to stay in the harbor receive a health certificate and are subjected to medical supervision for 12 days.³

d. The vessel is then admitted to free intercourse, but admits a health inspector on board, who will accompany the vessel to its last Brazilian port and who proceeds as follows:

1. He examines daily, with care, all the passengers and the crew, and isolates with netting any who show symptoms of fever.

2. If mosquitos be present their immediate destruction is ordered at once.

* * * * *

I have cited only a few paragraphs to show that the authorities have thoroughly grasped the situation and

¹J. Dupuy: *Epidemiologie de la Fievre Jaune*, *Revue d'hygiene et de Pol. San.*, Paris, 1906, xxviii, 13-29.

²Otto and Neumann.

³This is based on the prolonged periods of incubation reported by Marchoux, Salimbeni and Simond, and is unnecessary, because it has never been shown conclusively that an incubation period of more than six days and a few hours can follow a simple mosquito inoculation. In every instance in which a longer period of incubation is proved the subject received injections of either serum or blood. These observations therefore can have no practical bearing on measures directed against the natural infection which is produced by the mosquito alone.

their ultimate success is assured. The gigantic nature of their undertaking in an insanitary subtropical city of more than a million inhabitants can hardly be conceived, and their enlightened and determined efforts are exciting the admiration of the scientific world. With continued perseverance they will eventually attain the same degree of success that has been achieved in Cuba and their example will be followed by the smaller Central American republics.

After four years of immunity Cuba has been caught napping. According to the last report of the United States Public Health and Marine-Hospital Service⁴ she has had 70 cases of yellow fever with 15 deaths between October 16 and December 17. Two of the cases were imported. According to the newspapers six additional cases have been reported up to December 25. While the condition is serious there is no epidemic and the authorities have the situation under control. The large number of cases relative to the deaths reported shows that but few, if any, cases escape detection. I feel sure that the disease will be eradicated within the next two months. One or two or a few cases may appear in the early spring because some of the infected mosquitos may escape fumigation and survive through the short winter. There is no reason to apprehend, however, that Havana will again become seriously infected.

Although I am now two years beyond the half century mark, I think I can reasonably expect to live to see the day when yellow fever shall have been exterminated from the whole American continent, and that means practically from the world. Let us hope that the beautiful city of New Orleans will never again be devastated by the American plague from which she has suffered so terribly and so often. The price of safety is eternal vigilance; the greatest danger from yellow fever lies in the escape of mild and doubtful cases. One of the first to apprehend the full import of the mosquito theory was Doctor Quitman Kohnke, and I can recall with what pleasure I listened in Washington, several years ago, to his able, courageous, and masterful contention for it, before a rather unsympathetic audience.

In the sad experience here during the past summer, we have seen an effectual demonstration by the various officials under Doctor White of the efficacy of measures directed against the mosquito. With this and the evidence already brought forward by Guiteras and the French, German and Marine-Hospital Service Commission, it should never again be necessary to contend for the well proved fact that without the agency of mosquitos there can be no yellow fever.

Sore Throat in Cattle.—A disease is prevalent among horses at Centreville, Md., which resembles quinsy or tonsillitis. The animals are affected with swollen glands, high fever, loss of appetite, and frequently with swelling and loss of the use of their limbs.

⁴Public Health Reports, Washington, December 22, 1905, p. 2739.

GONORRHEA IN WOMEN.

BY

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There is no record of the time when gonorrhea first attacked the human race, but ancient literature, both biblical and secular, bears testimony to the existence of the disease.

Moses, in the fifteenth chapter of Leviticus, writes, "When any man hath a running issue out of his flesh, because of his issue he is unclean." Celsus clearly refers to balanitis and phimosis "due to ulcers under the prepuce or in the glands or in the urethra, and from them may come a purulent discharge." Inflammation of the testicles not due to external violence is also mentioned by him. Strange to say neither Greeks nor Romans wrote of the disease. It is known, however, that Roman doctors declined to treat venereal diseases, leaving it to the slaves. It is probable that they also considered it beneath their professional dignity to write of it. They merely referred to the disease as "*morbis indecens*."

In the Jerusalem Talmud frequent references are made to gonorrhea. Even as late as 1753, the urethral discharge was supposed to come from an abscess in the passage. We find the term "venereal" as applied to diseases communicated by sexual intercourse first used by Bethencourt, of Rouen, in 1527. The word "clap" is derived from clapiers, which were public shops kept by prostitutes.

Appreciating as we now do the astounding frequency of the disease, and its direful results, it will ever be a source of wonderment that one of the most common of the diseases of women should remain so long unrecognized. Sänger estimates that in one-eighth of all gynecologic diseases, gonorrhea is the underlying cause, and this view is supported by Taylor. Yet, as Dr. Lyons, of New York, has said: "Notwithstanding all the facts which have accumulated in the study of this disease in the last few years, it is a lamentable truth that there is no disease, at least of such common occurrence, that is so little understood, the diagnosis of which is so often missed, so much neglected, and so improperly and unsatisfactorily treated by the vast majority of the profession."

Our appreciation of the awful prevalence of the disease originated in the observations of Noeggerath, of New York City, but the full significance of the lesions and their extent were made possible by the discovery of the essential cause, the gonococcus of Neisser in 1879. As Bumm has happily put it, Noeggerath was more fortunate than Semmelweis, he lived to see the triumph of his observations. For this he has to thank Neisser, who soon after discovered the gonococcus and made possible the certain proofs of his statements relative to the frequency of the lesion.

Prior to these epoch-making periods gonorrhea was diagnosed in the male with comparative ease because of the fact that of 100 discharges from the male urethra 99 are due to gonorrhea, while in the female urethral and

leukorrheal discharges are due to a great many causes and therefore the only positive means of identifying a gonorrheal discharge is to recognize the essential cause.

Noeggerath made extended observations in New York City and published statistics that provoked no little criticism. He stated that 80% of married men have had gonorrhea, that 50% of these have never been thoroughly healed, and that of five married women three have gonorrhea. That his deductions from personal observations are regarded as extravagant and unwarranted would seem apparent from a study of the literature.

Zweifel and Sänger agree in the finding of 18% of women with gonorrhea. Fitch, however, asserts that of every 100 women who have married men formerly infected with the gonococcus, hardly ten remain well, and the others have some gonorrheal ailment. I am persuaded from personal experience that Fitch is altogether justified in his partial endorsement of the views of Noeggerath. Certain it is that these two eminent authorities are not far wrong.

The gonococcus of Neisser is a diplococcus averaging 1.25 mm., with an interspace of about 0.8 mm. between the two halves of the organism. Occasionally groups of four cocci are seen, and more rarely single cocci exist. The organism grows best at body heat, but its growth is not retarded at freezing temperature or at a corresponding high temperature. It will not grow on gelatin or agar, but on blood-serum plus pepton agar (Wertheim) the organism grows slowly. It grows in a neutral, slightly alkaline, or faintly acid medium. When dry it soon perishes, hence the dried secretions soon lose their virulence.

In 353 cases of gonorrheal infection, Laser found the gonococcus in the urethra 111 times; 7 times in the vagina in 180 cases, and 21 times in the cervical canal in 67 cases. It is interesting to note that in four-fifths of the 111 cases of urethral infection there were no microscopic evidences of urethritis. I have repeatedly demonstrated the gonococcus in the urethra where there was no visible secretion. As a rule, however, these organisms coming from the urethra in the absence of a purulent secretion have lost much of their virulence. Previous to the discovery of the gonococcus by Neisser and the adoption of simple means of detecting the organism, it was believed that a gonorrheal urethritis was terminated when the discharge disappeared. Laboring under such a delusion, it was no wonder that the profession was unwilling to accept the statement of Noeggerath that the gonococcus existed the lifetime of the individual and could transmit an infection long after the disappearance of all symptoms. Now we are all but ready to say Noeggerath was right; the gonococcus can exist in the tissues throughout the lifetime of the individual, and at any time under favorable influences the infection may light up into what appears to be a new and acute infection, or may transmit a virulent infection without itself becoming manifest.

The discharge accompanying a chronic gonorrheal urethritis or endometritis is proved to be virulent only when the microscope reveals the presence of gonococci or when sexual intercourse results in infection. The

amount of the discharge or its constancy does not indicate the degree or virulence. We have demonstrated the presence of the gonococcus in the absence of a discharge and we have failed to detect the gonococcus in the presence of a chronic discharge.

Individuals are observed to infect others, yet apparently are themselves immune to infection. The explanation lies in the presence of a chronic gonorrheal infection in the absence of all clinical signs. In the first individual the gonococcus had little virulence, but when transmitted to sterile tissues it assumed an active role.

Husband and wife may both be infected, neither manifesting symptoms of the disease, yet a third individual having intercourse with one or the other may acquire a virulent infection. Again, the husband may infect his wife, then have no intercourse with her until he is apparently cured, when on resuming sexual relations with his wife whom he had previously infected, he in turn is inoculated by her.

That there is an acquired immunity there can be no doubt, yet examples are not rare in which a second infection has followed closely upon the first. Congenital immunity has been observed, but such instances are seldom observed.

Gonorrhea may exist in the genital tract during the period of pregnancy without clinical manifestations and become active during the puerperium. This explains many obscure cases of puerperal infection. Oppenheimer found the gonococcus in 27% of 108 pregnant women. The menstrual act may have a similar effect.

That gonorrheal infection is frequently conveyed by contaminated hands, instruments, and dressings is a fact too well established for comment. Happily, however, this danger is minimized by the early death of the organism in dried secretions.

Wertheim obtained a pure culture of the gonococcus from a gleet of two years' standing. Attempted inoculation of the original urethra with these organisms failed. Then a urethra free of infection was inoculated, causing an acute inflammatory reaction, and from this infection the original urethra was inoculated, and a fresh attack was produced which ran a typical course for six to eight weeks and then subsided into a chronic state. It was thereby proved that by passing gonococci through a second individual they may acquire added virulence. This explains how an apparently healthy subject of chronic or latent gonorrhea may infect his wife and in turn be infected by her. It is observed that the gonococcus increases in virulence during and immediately following menstruation and pregnancy.

It is comparatively rare that gonorrheal infection is acquired by means other than sexual intercourse, for the reason that the secretions when dried are innocuous. This is most fortunate, for otherwise we should experience epidemics which would be appalling. We have in the spread of ophthalmia of the newborn in maternity wards a suggestion of the contagious element in this disease. I now have under my care a woman who was infected from soiled towels used by an inmate of the house and who in turn infected her husband. Examples are not wanting in which several members of a family have acquired the infection from the bathroom, and cases have

repeatedly been traced to the dispensary and office, where the instruments and hands of the examining physician were not properly cleansed. Several children sleeping in the same bed are known to communicate the infection one to another, and children who are nursed by infected mothers and maids are not infrequently contaminated.

The period of inoculation of gonorrhea varies from 12 hours to a week or more. It is not easy to fix upon this period of inoculation in a given case, because the patient is not always aware of the lesion until it has existed for some time. In fact, if the infection does not spread beyond the internal os, the patient may remain in ignorance of the disease. We are thereby reminded of the uncertainty of relying upon the statements of the patient as to the possible existence of a gonorrheal infection.

We usually estimate the period of inoculation from the time of intercourse to the onset of symptoms. A more exact procedure would be to count to the time of appearance of an inflammatory reaction in the urethra or cervix, but since these lesions are not looked for until symptoms arise we can only arrive at an approximate estimate of the period of incubation. Experimental inoculation with pure cultures of the gonococcus has caused an inflammatory reaction in from 12 to 24 hours.

The gonococcus belongs to the group of microorganisms which can infect a tissue without loss of the overlying epithelium. Surfaces covered with single or multiple layers of cylindric epithelium or with soft transitional epithelium are places of predilection. Hornified, stratified, squamous epithelium does not wholly protect the underlying tissues from invasion, as exemplified in the vagina, which may be infected, though rarely in the period of sexual maturity.

The anatomic recognition of gonorrhea of the urogenital tract presents many difficulties, and may be impossible, particularly in cases of long standing. For this reason the diagnosis must occasionally rest upon the finding of an inflammatory lesion in one or more portions of the tract and associating these lesions with a history of exposure to gonorrheal infection. The clinical history alone may point unmistakably to such an infection, but gives no clue as to its extent and degree. Only the physical examination of the involved structures can afford such information. Furthermore, a diagnosis that admits of no doubt can only be based upon the finding of the gonococcus in the secretions or tissues. This is by no means easy in the chronic stages when there is little or no secretion, and the organism, which at best is recognized with difficulty in the tissues, is found in small numbers or may be wholly wanting. The small size of gonococci and their scarcity in the tissues of chronic cases may necessitate the microscopic examination of a large number of sections. This involves rare skill in technic, not only in the preparation of the sections, but in the differentiation of the gonococcus from other cellular structures.

Formerly the gonococcus was regarded as a parasite of the mucous membrane, but the admirable work of Wertheim established the now well-recognized fact that it may deeply invade the underlying connective tissue. This, however, is still regarded as exceptional, for in the

majority of cases the gonococcus is confined to the mucosa.

In the urethra we find, during the acute stage, that the gonococcus advances by way of the intercellular spaces to the deeper structures of the mucosa and into the underlying connective tissue. As the acute stage merges into the chronic there is a less diffuse distribution of the organism and the leukocytes, the gonococci confining themselves to isolated areas in the superficial structures, particularly those areas which present to the unaided eye congested and ulcerated regions. Similar observations in the bladder were made by Wertheim.

Those surfaces of the genital tract which are covered by stratified, squamous epithelium, *i. e.*, vulva, vagina, and vaginal portion of the cervix, evince a peculiar resistance to gonorrheal infection during the period of sexual maturity. In infancy and old age this epithelium has a much lower resistance, and primary gonorrheal vulvovaginitis is not uncommon.

In the height of the infectious process the papillae are crowded with small round cells. On the surface of the mucosa is a deposit of pus cells and cellular debris, and in this deposit are found gonococci in varying numbers. These organisms extend into the intercellular spaces of the epithelium, but have not been demonstrated to invade the underlying connective tissue.

The Bartholinian glands, which are frequently involved, are said by Bumm not to be deeply invaded by the gonococcus. Bumm asserts that the gonorrheal infection is confined to the mouths of the glands; that the natural secretions of the glands prevent the further invasion of the organism. According to Gebhard, all deep-seated infections of Bartholinian glands are the result of mixed infections of the gonococcus and staphylococcus.

We are indebted to Wertheim, Uter, Madlener, Tussembroek, and Mendes de Leon for their studies of gonorrheal infection of the uterus. By these observers numerous groups of gonococci were seen to occupy spaces between the superficial epithelial cells and to a lesser extent the intercellular connective-tissue spaces. Madlener made histologic observations in a case ten weeks after the initial infection, which was the seventh week of the puerperium. In this case gonococci were distributed throughout the entire uterine musculature. Bumm states that only once has he seen the gland structures invaded by the gonococcus. This was in a Nabothian follicle, in which large colonies were found in the retained secretions.

In the fallopian tubes the gonococcus has been repeatedly recognized in the pus contained within the lumen of the tubes and in the mucous lining. Morax and Raymond found the gonococcus in the superficial layer of the mucosa. Bumm found nests of gonococci in the mesosalpinx in one case and Wertheim in two cases. In one of Wertheim's cases the tube was removed three months after the initial infection. Gonococci were found not only in the pus contents of the tube but also in the intercellular spaces of the mesosalpinx and in the plastic exudate covering the serosa. Doubtless this is an exceptional case, for in the tube, as in other parts of the genital tract, the organisms are usually confined to the mucosa.

The ovary is rarely if ever attacked by the gonococcus in the absence of a previously infected tube. Wertheim in two cases found groups of gonococci in the walls of ovarian abscesses. It is not possible to say whether the organisms reached the ovary by way of the tube, peritoneum, or broad ligament. It is probable that most of these ovarian abscesses take their origin in the corpus luteum, which in turn is infected from the tube.

Localized pelvic and general abdominal peritonitis due to gonorrheal infection has been demonstrated very rarely by bacteriologic observations, though clinically it is well known. Bumm expressed the belief that the gonococcus could only live on mucous surfaces. Wertheim disproved this view and others have supported his experiments by clinical observations. Cases of general gonorrheal peritonitis are reported by Koehler, Frank, Cushing, Veit, and Menge. Hunner and Harris reported 7 cases and gave an analysis of 39 previously reported cases.

Little is known of gonorrheal infection of the pelvic connective tissue. That gonorrheal abscesses do form in connective tissue is demonstrated by Wertheim, Dinkler, and Jadessohn, but the bacteriologic observations which have been carried on in cases of pelvic cellulitis of gonorrheal origin have led to great confusion.

Latent gonorrheal infection as a cause of puerperal sepsis is a subject of the greatest interest. In the Dresden clinic in 1878 there were 2,300 labors, and in the cases in which fever arose during the puerperium gonococci were demonstrated in the lochia in one-fourth. It is, however, not to be inferred that in all cases the gonococcus was the cause of the puerperal fever. In 1887 Veit pointed out the significance of latent infections in the endometrium as causes of puerperal infection. It is, of course, impossible to say that in given cases of puerperal sepsis the responsibility lies with the organisms which have preexisted in the tissues of the uterus and its appendages. There is no positive way of excluding direct contamination prior to the origin of the fever. Examples are not wanting in which a latent infection in the uterine appendages has been directly charged with the responsibility of puerperal infection.

Until our methods of excluding to an absolute certainty all possibility of contamination are accomplished we are in no position to speak with assurance of the role played by latent infections in the origin of puerperal sepsis.

Diagnosis.—We are able to arrive at a clinical diagnosis of gonorrheal infection in a large number of cases by consideration of the history without a physical examination. Such a diagnosis is at best imperfect, in that it no more than establishes to a high degree of probability the existence of gonorrhea in the genitourinary tract without any exact knowledge of the extent of the infection. For example, a child nursed by a mother or maid who is known to have a gonorrheal discharge acquires a leukorrhea with signs of inflammation about the vulva; a recently married woman experiences a leukorrhea with burning pain on urinating, and it is learned that her husband at one time had a gonorrheal infection, though there has possibly been no evidence of it for months and years; a woman who was previously free of all com-

plaint submits to illicit intercourse and in a few days suffers from painful urination and leukorrhea; such histories lead almost certainly to the diagnosis of gonorrhea.

Grave mistakes have been made in diagnosis by assuming that no infection exists because the usual complaints of an acute infection do not appear in the history. It is to be remembered that *a woman may acquire a gonorrheal infection without her knowledge, and in the absence of all local or general symptoms.* Such an infection is confined to the lower genital tract and either disappears spontaneously within a variable period of time, or is subsequently caused to extend higher in the genital tract, where with each advance from the cervix to the corpus, from the corpus to the tubes, and from the tubes to the ovaries and peritoneum, the general and local disturbances are exaggerated.

Gonorrheal urethritis is frequently observed in the acute stage, but is comparatively rare in the chronic stage. In six to ten weeks it is often possible to regard the patient as fully recovered from the urethral infection. As compared with the male urethra, chronic gonorrheal urethritis in women is exceptional.

The acute attack is ushered in by a tickling and burning sensation before and after urinating. There is a transparent serous secretion, to which are added pus cells, desquamated epithelium, and gonococci, which by the end of the third day cause the secretion to be thick and yellow. There is tenderness along the course of the urethra, and not infrequently in the bladder. Separating the labia with the fingers, the meatus appears red and swollen, and from the urethra may be expressed a drop or more of pus. In three or four weeks the urethra usually appears normal, though a drop of pus can sometimes be expressed by stripping the urethra. In a small proportion of cases the lesion passes into a chronic stage, in which the urethra becomes firm from thickening. Through the endoscope part or all of the urethra appears swollen, having little or no secretion. Strictures are seldom formed. Exacerbations, with all the usual manifestations of a recent acute infection, are the rule. These exacerbations can usually be explained by the presence of gonococci in the crypts near the meatus. From these crypts pus can often be expressed which contains gonococci in the absence of an apparent lesion elsewhere in the urethra.

Gonorrheal vulvitis is not uncommon in childhood, at a time when the epithelial covering affords little protection. During the period of sexual maturity gonorrheal vulvitis is rare, because of the protection afforded by the epithelium. It is said that chronic gonorrheal vulvitis does not exist, because of the rapidity with which healing takes place. The vulva is usually infected secondary to the endometrium and urethra, the epithelium becomes macerated by the secretion and then infected. In acute gonorrheal vulvitis the tissues are deeply congested and the surface is covered with pus or a pseudodiphtheric membrane. Underneath the secretion superficial or deep ulcers may form; they are sensitive and bleed to the touch. The pus accumulates in the fossa navicularis. The hymen is swollen and red. Eczema of the labia and neighboring skin arises from lack of

cleanliness. The vulvar glands may be infected and transformed into numerous small abscesses containing gonococci. Associated with these changes are sensations of heat and burning about the external genitals, burning on urinating, and embarrassment in walking and sitting. These subjective symptoms usually disappear in three to five days, and within two weeks little or no trace of the lesion remains. Healing is slower in childhood and in old age.

Gonorrheal bartholinitis is found in all stages of the disease. The Bartholinian gland has been observed to be infected within 14 days of the original infection, but the rule is that weeks and months intervene before these glands are involved. Both glands are commonly infected, though one usually precedes the other. The position and size of the outlet of the gland have something to do with the time and frequency of the infection. According to Bumm, the infection is confined to the mouths of the glands and does not extend to the deeper portions. Undoubtedly such is the rule, but it cannot be considered invariable. It is said that the secretions of the gland provide immunity. This statement may be accepted as the probable explanation of the infrequency with which the depth of the gland is involved. The outlet of the gland becomes red and swollen. These maculas (*maculae gonorrhoeicae* of Sanger) are regarded as highly diagnostic. Gonococci may or may not be found in the secretions of these glands. When the gland is enlarged, it is felt in the labia majora as a spindle-shaped or round body, varying in size to that of a hen's egg, tender and sometimes fluctuating. It is possible for the glands to be infected without palpable enlargement.

Gonorrheal vaginitis as a primary lesion is exceedingly rare, and seldom, if ever, reaches the chronic stage. The explanation lies in the protection afforded by the pavement epithelial covering and the rapidity with which lesions of the vagina heal. The finding of the gonococcus in the vagina does not signify gonorrheal infection of the vaginal tissues. They come, rather, from the urethra and uterus, and lie in the vaginal secretions without attacking the tissues. To demonstrate the absence of gonococci in the vagina the Schultze method may be employed. This consists in thoroughly cleansing the vagina with douches, then inserting a tampon of sterile absorbent cotton against the external os. If the secretion which collects below the tampon is free of gonococci, while that which collects on the tampon is contaminated, the infection is demonstrated to be confined to the uterus and possibly the appendages. These uterine secretions may cause swelling and mottling of the vaginal mucosa.

In acute gonorrheal vaginitis the temperature may be elevated, physical exertion causes some distress, and to the examining finger the vagina is hot and tender. Erosions and ulcers may develop beneath the purulent secretion. Healing is usually complete within a month.

Gonorrheal metritis is found in the acute and chronic stages. The uterus is a favorite site for gonorrhea. In the absence of the gonococcus in the leukorrheal discharge it is impossible to diagnose gonorrheal metritis, because the general findings are identical to those of other infections of the uterus. The cervix or a part of it

may be alone infected, or the entire uterus may be involved. Formerly it was believed that the infection was confined to the endometrium, but we learned from Wertheim that gonococci may be found even to the serous covering of the uterus.

In acute metritis involving the cervix (acute cervicitis) the lips of the cervix are swollen, congested, sensitive, and bleed when handled. From the external os there exudes a mucopurulent secretion which contains the gonococcus. Follicles containing pus may be formed from the glands about the external os. The vaginal discharge may be the only complaint. There may be burning pain from an irritated vagina; backache and pain in the groin and hypogastrium are frequent accompaniments, and the temperature may be elevated to a slight degree. So long as the infection is confined to the cervix there may be an absence of all symptoms and the patient may not be aware of her condition.

When the uterine body is invaded the foregoing clinical features are exaggerated. Bimanual examination reveals a uterus tender and possibly slightly enlarged. An anesthetic may be required because of extreme tenderness. The consistency of the uterus may be somewhat increased and the body less movable upon the cervix than normal. Not all individuals suffer equally. It is said a multipara suffers less than a nullipara. The rapid recession of the local and general signs of acute infection may be regarded as a characteristic of gonorrheal infection.

Chronic gonorrheal metritis is so varied and oftentimes obscure in its clinical manifestations that the true nature of the infection, and even the presence of any sort of infection, might be overlooked without systematic bacteriologic examinations. All the usual symptoms may be wanting. A careful examination of the uterus may reveal no change in the size, mobility, and consistency. There may be no undue sensitiveness and an absence of a visible secretion. Yet the gonococci may be found in the transparent, viscid secretion of the cervix. Chronic gonorrheal metritis has as its all but constant sign a mucus or mucopurulent discharge. Erosions are often seen on the cervix, and the entire uterus may be uniformly enlarged, firm in consistency, and somewhat tender to pressure. Exacerbations of pain, tenderness, and a purulent leukorrhea are suggestive of gonorrheal infection.

There is nothing in the macroscopic or microscopic appearance of the tissues of the uterus that will characterize a gonorrheal infection. The tissue changes are identical with those of puerperal infection. On the vaginal portion of the cervix are erosions of the papillary, glandular, and follicular varieties. In the cervix and body of the uterus the macroscopic appearances are those of endometritis of the hypertrophic, polypoid, or fungus types, which under the microscope present the usual picture of glandular or interstitial endometritis. *It is only by the detection of the gonococcus in the tissues that the diagnosis can be made with certainty.*

In the wall of the uterus there is commonly an excess of connective tissue which may be associated with a corresponding atrophy of the muscular elements. The vessel walls may be thickened in the medial and adventitious coats and the lumens of the vessels filled with

blood. These are the usual findings of chronic metritis of whatever cause, and a diagnosis of gonorrheal origin can only be made by finding the gonococcus in the tissues, but this is by no means easy.

Gonorrheal salpingitis follows the involvement of the uterus. The infection has been known to reach the tubes 10 to 14 days after the initial infection of the cervix, but the rule is that the infection remains confined to the uterus months and possibly years before it is conveyed to the tubes. *Hence the necessity of giving a guarded prognosis as regards the involvement of the tubes in gonorrheal infection of the uterus, no matter how limited the infection may be.* The infection is not infrequently made to extend from the uterus to the tube by intrauterine manipulations with the sound and curet. This fact should make us cautious in the use of these instruments when the infection is confined to the uterus and has not yet reached the tubes.

Following upon menstruation, and particularly upon childbearing and abortion, the infection is prone to extend to the tubes. Here we have the explanation of many cases of tubal infection arising in the puerperium without an assignable cause. It is said that the invasion of the tubes is always marked by an acute onset of the symptoms. Gonorrheal salpingitis is often ushered in by a chill, the temperature rises and pain and tenderness develop in the locality of the tubes. Usually both tubes are involved. The menstrual periods are prolonged and painful. In the acute stage muscular rigidity makes an anesthetic imperative if the tubes are to be located and outlined. Great caution is to be exercised in palpating the tubes in the acute stage for fear of stripping pus from the abdominal end of the tube.

Under narcosis the tube is outlined as an irregular, elongated mass extending from the horn of the uterus directly outward or lying to the side of or behind the uterus. It is seldom freely movable and is more often firmly adherent to the neighboring structures. In the early stage the tube may be but slightly enlarged; in fact, the lesion may escape detection. Throughout the chronic stage exacerbations are frequent, and these are attended by all the subjective and objective signs of an acute infection.

When the tube becomes distended with pus (pyosalpinx) and the infection extends beyond the tube to the ovary and peritoneum, the symptoms are increased and prolonged. The nervous system may become greatly disturbed and digestive disorders are added. The distended tube may reach the size of a child's head. It is tender, usually immovable, irregular in outline, and lies at the side of or behind the uterus.

Gonorrheal ovariitis is an almost constant sequel to tubal infection. There are no distinctive clinical features in ovariitis not found in salpingitis, and it can only be assumed that the ovaries, together with the tubes, are involved. With the involvement of both tubes and ovaries sterility is the almost inevitable result.

All the inflammatory lesions common to the ovary are observed. Adhesions form about the ovary binding it to the tube and surrounding structures. Newly-formed connective tissue may develop in the substance of the ovary and lead to cystic degeneration. These

changes in and about the organ are fruitful sources of sterility. In addition to these pathologic conditions, abscesses of the ovary are not infrequently developed.

The clinical picture of gonorrheal peritonitis does not differ from that of other forms of peritonitis.

Gonorrhea of the rectum is a lesion little recognized, but which undoubtedly exists with greater frequency than is generally appreciated. Baer, in 429 cases of gonorrheal infection, found 32 (8%) with involvement of the rectum. The main causes were coitus per anum and lack of cleanliness, in the presence of infectious vaginal secretions. The diagnosis can be confirmed only by demonstrating the presence of the gonococcus in the secretions.

Prognosis.—The inhibiting influence of gonorrhea upon the procreative capacity of women should demand our serious consideration, for to this disease a large proportion of sterile marriages may be ascribed. A review of the literature will convince one that gonorrheal infection is not necessarily a barrier to conception. Statistics from a number of the continental hospitals show 20% to 25% of pregnant women to be infected with gonorrhea. Gonorrhea of the cervix does not prevent pregnancy, and it has repeatedly been shown that endometritis and salpingitis of gonorrheal origin do not always preclude the possibility of pregnancy. Brothers reports two cases with bilateral pus tubes, in which the patients subsequently gave birth to several children. A similar case was recently observed by myself. Noeggerath found that 49 out of 81 wives of men known to have had gonorrhea were absolutely sterile, and 11 were relatively sterile. Glünder found that in 87 sterile marriages 62, or 71.3%, were chargeable to gonorrhea. Bumm estimates that 30% of gonorrheal patients are sterile.

The so-called "one-child sterility" is accounted for in large measure by the extension of a preexisting gonorrheal infection during the puerperium, for it is a long-established fact that in the puerperium the infection which was confined to the cervix and urethra is prone to extend to the corpus and tubes, and will then almost certainly result in sterility.

Inasmuch as the prognosis is largely influenced by the location of the infection, it will be of the greatest interest to inquire into the frequency of the various local infections. Steinschneider found in 37 cases that the urethra was involved 34 times. In only one case was the vagina infected, and this was in a girl aged 9. The cervical secretions contained the gonococcus in 16 cases. Fabey, in the clinic of Doutralepont, observed 38 cases in which the gonococcus was found in the urethra alone 20 times, in the urethra and cervix 16 times, and in the cervix alone 2 times. Brünseke, of the Würzburg clinic, observed 200 cases, of which 90% were of the urethra, 37.5% of the cervix, and 12.5% of the Bartholinian glands. Nelsser attributes 45% of sterility in women to gonorrhea. Zier-Ascher found that 121 of 227 women infected with gonorrhea were sterile.

The influence of gonorrhea upon the course and termination of pregnancy is a subject that should engage our serious attention, for while a gonorrheal infection frequently does not preclude the possibility of conception, it not seldom happens that the course of pregnancy is

interrupted, and that the puerperium presents serious complications which may hazard the life of the patient. Säger affirms that the abortive influence of gonorrhea is as pronounced as that of syphilis, and that in a large proportion of gonorrheal women abortions are inevitable. Noeggerath found that 19 out of 53 women who became pregnant in the course of a gonorrheal infection aborted. Frühinsholz collected a series of 201 pregnancies in the course of gonorrheal infection, and of this number 161 women went on to full term, 4 aborted, and in 36 pregnancy was terminated by a premature accouchement.

It is admitted that gonorrheal salpingitis predisposes to ectopic pregnancy by distorting the course of the tube and destroying the ciliated epithelium of the endosalpinx. These changes tend to arrest the descent of the ovum through the tube.

One case in six of puerperal sepsis is caused by gonorrhea. Of this number few are the result of contamination in labor and the puerperium. The majority are due to preexisting infections in the genital tract which are awakened to renewed activity and caused to extend; a gonorrheal cervicitis extending to the body of the uterus and thence to the appendages; a latent infection in the appendages extending to the peritoneum, and thus it happens that an infection which may have been previously unrecognized becomes a serious menace to life.

The risks to the offspring, while not so serious as in syphilis, are not to be underestimated. In the passage of the child through the maternal parts it undergoes, as Morrow has expressed it, "a veritable baptism of virulence." The conjunctivas become infected and the possibility of blindness is imminent. It is estimated that from 10% to 30% of the blindness in the world is ascribable to gonorrhea. According to Nelsser there are now in Germany 30,000 blind persons whose loss of sight may be thus accounted for. It is estimated that of the inmates of the asylums for the blind on the continent blindness due to gonorrhea ranges from 20% to 80%. Happily the frequency of this accident is being materially reduced by antiseptic vaginal douches given prior to the delivery, and by the employment of the Credé's method of treatment of the eyes of the newborn.

J. Taber Johnson writes as follows:

"I know of no statistics of the mortality arising from gonorrheal infection of the female organs of generation, but we can obtain an approximate idea when we consider the great number of major surgical operations performed on its account, the number of abortions caused by it, and the untold number of conceptions prevented by the disastrous results of such infections.

"There is little doubt in my mind that, at a most conservative estimate, one-half million prostitutes are living in houses of ill-fame in our large cities and I am not sure a million would not be nearer correct; writers on this subject generally estimate as many women living lives of easy virtue outside as inside of the disreputable houses. In our country alone we have, then, one million and a half, if not twice that number, who have or are liable to have gonorrhea any day, with all the possible consequences referred to.

"It is estimated that from 40,000 to 50,000 prostitutes die annually, and that their places are immediately filled by new recruits. While much of this mortality may be

due to the results of dissipation and natural causes, at least 30 % of this mortality is due to the direct effects of gonorrhea.

"It is estimated that 110,000 deaths occur annually from tuberculosis in our country, 107,000 from pneumonia, and 43,000 from typhoid fever. While there are no statistical reports of investigations of the mortality due to the infections and ravages of gonorrhea on the female generative organs, I have little doubt, if it can be ascertained, that the race suicide arising, directly and indirectly, from this disease would equal the mortality of any of the three diseases mentioned, and I am not sure that it would not exceed them all combined, if we take into consideration the depopulation caused by the one-child sterility, and also the absolute sterility produced by gonorrheal inflammation of the uterus and its appendages.

"It is customary to include the death of the child when comparing the maternal mortality of craniotomy with that of cesarean section. Thus, if 25 % or 75 % of maternal deaths occurred after craniotomy, the mortality of the operation would be stated as 125 % or 175 %, as the case might be. So, in speaking of the mortality of the effects of gonorrhea on the female generative organs, one might on the same principle include that indefinite multitude of children which would have been born but for the inhibitory effects of the gonococcus on the female conceptional capacity."

Referring to the *sociologic aspects of gonorrhea*, Ernest Cushing says:

"In considering the subject of gonorrhea we realize that it is a factor of the greatest importance in influencing the fortunes and destinies of nations, as well as of individuals, inasmuch as it is essentially a disease of dense populations and of the congestive life of cities, thence spread broadcast by the influence of civilization and commerce, and acting wholesale as a check on reproduction. Although its full importance has become apparent only within the last few years, yet we cannot doubt that for ages this disease has acted in the same way, and if time permitted I could trace the connection of this influence with the historic facts known as to the degeneration and disappearance of conquering races when subjected to the influences of older and more corrupt civilizations, as well as to the decline and fall of successive empires and peoples.

"This disease, then, is to be considered as a blight or parasite following civilized man as other pests prey on the cultivated crops and domestic animals; in a large way, it may be said to limit the reproduction of those individuals, families, and societies which cannot or will not confine their sexual activity to the limits imposed by the conditions of civilization."

Prophylaxis.—Since the cure of gonorrhea is so unsatisfactory, and when deeply seated is usually only accomplished by a mutilating operation which too often unsexes the woman, prophylaxis becomes the paramount issue in the management of gonorrhea of women.

The prevailing impression among men that gonorrhea is a trifling disease, a mere incident in their experiences which is no more serious than the "catching of a cold," is responsible for not a little of the spread of the disease. Much good would be accomplished if the public could be made to appreciate the serious consequences of the disease. It should be impressed upon men in general that once they become infected they are sexually incapacitated until pronounced cured by an expert; that long after the active stage of the disease has passed, and the gleet discharge has disappeared, they may transmit a virulent infection.

But, unfortunately, it is not alone the laity which is in need of education in this respect; the profession is often guilty of being too hasty in pronouncing a cure and in giving sanction to marriage and to the resumption of the marital relation. Untimely interference with uterine and urethral applications in the early stage of the disease too often causes an extension of the infection and makes a serious lesion of what might otherwise have been a self-limiting disease.

It is, in fact, questionable if the average general practitioner is competent to pronounce a patient absolutely cured, inasmuch as the final test must be the exclusion of the gonococcus in repeated examinations.

Our office is then to instruct and enlighten the community so that a public opinion may be formed, which is the only reliable foundation for the enforcement of laws. Meanwhile, then, it is the duty of our profession to instruct itself and then to enlighten the community as to the importance and gravity of the disease.

From Cushing we further quote:

"When, however, we come to consider the subject of the regulation of prostitution, which is usually attempted when its total suppression is found impossible, we find that it is not only a question of police, but also very largely one involving the medical profession, since both in diagnosis and treatment the police must depend on medical assistance. In the first place, the attempt to suppress and extinguish the disease would be entirely futile since the diagnosis is too difficult, the duration is a latent form too long, and the fact of cure too uncertain. Moreover, a very large proportion of cases of gonorrhea are acquired not from prostitutes by trade, for they are instructed in their business, live under some discipline in brothels, and keep themselves clean, avoiding infection by knowledge and being driven out when known to be diseased; but the most dangerous women are precisely those who are not prostitutes by trade, but who are unchaste enough to submit to opportunities of infection, ignorant enough not to know their danger or avoid it, shamefaced enough to conceal their disease, and so keep spreading the malady.

"Medical regulation and supervision of prostitution are therefore inadvisable, inadequate, and promotive of a false sense of security from infection."

When may a man who has, or who has had gonorrhea, safely marry? This is a question which frequently confronts the physician. The answer is emphatic and uncompromising that the time for marriage is not until after repeated bacteriologic examinations there is demonstrated an entire absence of gonococci. This pathologic fact must be accepted as the sole basis of the physician's decision.

When the wife is infected the physician should interdict pregnancy until a cure is effected. This rule must be enforced in the interest of the mother and child—the former who is thereby imperiled in health and life from extension of the disease, and the child who is exposed to a probable infection of the eyes which may lead to blindness.

Treatment.—In the management of gonorrheal infection in women there must be a keen appreciation of the possible dangers involved in medical and surgical interference, particularly in the acute stage. Unquestionably untimely interference is responsible for the extension of the infection. Therefore, in discussing the treatment of

gonorrheal infection, it is of paramount importance to distinguish between the acute and chronic stages.

In the acute stage of the infection rest is the first principle in the management of the case. All instrumental and digital interference should be dispensed with as far as possible. Digital examinations and the introduction of instruments into the vagina have repeatedly been known to convey a urethral infection to the cervix, and intrauterine manipulations to cause a cervical infection to extend to the body of the uterus, and possibly into the tubes. Furthermore, an infection which has passed to the tubes, but not beyond them, may be caused to spread to the peritoneal cavity by undue manipulation. Realizing these possible dangers, it is incumbent upon the medical attendant to avoid all measures which will disturb the infection when in the acute stage. Rest is then the first consideration in the management of an acute infection. The patient should be confined to her bed until the acute manifestations have subsided. Second in importance to rest is cleanliness. The urethra and bladder are most efficiently cleansed by increasing the amount of urine. This is best done by drinking large quantities of water and milk. It is questionable if in this stage any remedy taken internally will exercise any considerable antiseptic influence upon the infected mucous membranes of the urinary tract. Urotropin in .45 gm. to .65 gm. (7 gr. to 10 gr.) doses three or four times a day, is reputed to have such an antiseptic action, but doubtless its beneficial effects are overestimated. The list of drugs recommended for the treatment of acute gonorrheal urethritis and cystitis is long, but in my judgment they can all be dispensed with. Urethral and bladder injections of antiseptic and astringent solutions are productive of great harm in the acute stage, and should be proscribed. The vagina is to be kept free from leukorrheal discharges by the employment of vaginal antiseptic douches. Lysol, in 1% to 2% solution, mercuric chlorid, 1 to 2,000, are in common usage. In this way the vaginal and vulvar surfaces are best protected from infection conveyed in the leukorrheal discharges from the uterus. No other means need be employed in the treatment of primary or secondary gonorrheal vulvovaginitis.

The virtue of the vaginal douche does not rest solely in its cleansing properties. When the infection has spread to the upper genital tract the acute stage can often be aborted, and the distress relieved, by douching with liberal quantities of sterile water, or a mild antiseptic solution such as mentioned. In order that the best results should be obtained the patient should be in the recumbent position, and the douches continued for a period of twenty minutes at as high a temperature as is comfortable to the patient. These douches should be repeated every four to six hours.

As an adjunct to the douches glycerin and ichthyol tampons may be employed, which if not found painful should be used daily. Two or more small absorbent cotton tampons are soaked in a 7% ichthyol in glycerin solution, and are made to fill the upper segment of the vagina. Within four to six hours they are to be removed, because by that time the glycerin will have become saturated with the serum drawn from the pelvic tissues

and can then serve no good purpose. To remain longer in the vagina would be an injury in that they would collect the leukorrheal discharges and in turn would infect the vagina.

Under no circumstances is the uterine cavity or the cervical canal to be invaded in the acute stage with injections or with swabs for fear of extending the infection.

Surgery, then, has no place in the treatment of acute gonorrheal infection, with the possible exception of those rare cases in which an acute inflammatory exudate accumulates in the pelvis, which can be readily drained through the vagina without undue manipulation.

In addition to the foregoing, certain palliative measures may be employed to relieve pain. Hot applications are made to the hypogastrium, sitz baths are given, and when the pain is not relieved by such means opiates must be resorted to.

As suggested by Byford, "the desiderata are a remedy that will rapidly remove or destroy the germs without doing injury to the protective epithelium, and a method of application that will not carry the germs to the deeper portions of the genitourinary tract." But what is the remedy that will fill such requirements? Certainly the injections of sterile water which he recommends will not do so.

When the acute stage has subsided into a subacute or chronic condition more active local treatment may be resorted to. The time when this stage will be reached varies with the virulence of the infection, with the extent of the involved tissues, and with the conduct of the patient and attending physician during the acute stage of the disease. The time limits of the acute stage may be arbitrarily placed at from four to six weeks.

The treatment of gonorrhea in the chronic stage is largely local, and therefore a topographic discussion of the treatment will be found most practical.

Urethra.—In the exceptional cases in which a spontaneous healing of the urethra is not effected, local astringent and antiseptic injections are recommended. Silver nitrate, 1 to 2,000; protargol, 1 to 500; ichthyol, 1-5 to 100; these with many other solutions have been used with varying degrees of success. That no one remedy has proved eminently satisfactory is evident from the large number of remedies advised, and the hopelessly divergent views of experts as to their proper application. In the chronic stage of gonorrheal urethritis it must be remembered that the lesions are commonly localized in one or more areas, and are best treated with strong astringents and antiseptics, or the cautery, through an endoscope. For this purpose a 20% to 50% silver nitrate solution may be employed to good advantage, the applications being made with an applicator. Care must be taken not to overlook infected follicles, which, when found must be opened and cauterized.

Vulva and Vagina.—The method in general practice consists in injecting 10% to 20% solution of silver nitrate into the vagina. In infants this is best done by means of a catheter, and in adults by a cylindric glass speculum. When ulcerations develop in the vaginal surface the cautery may be used to advantage, and to prevent cicatrization of the vaginal walls the vagina may be packed with

iodoform gauze. When the Bartholinian glands are infected the only procedure that will guarantee no recurrence is to dissect out the glands.

Uterus.—When the acute stage has subsided into the subacute, and the active congestion has lessened, the danger of spreading the infection by various diagnostic and therapeutic manipulations, while not so great as before, is still possible, hence the greatest caution and reserve should be exercised. In the chronic stage, however, the danger is slight, and local treatment is not only admissible but advisable and even imperative. In the course of the treatment bacteriologic examinations are to be made from time to time to note the progress of the treatment. By so doing we are not dependent upon the deceptive and altogether unreliable clinical signs. The patient is pronounced free of infection only when repeated bacteriologic tests give negative results. Local treatments are never so successful when there is general malnutrition and anemia, hence the importance of supportive treatment in such cases. It is essential first to determine the extent of the infection, whether it is confined to the cervix or has spread to the body of the uterus. It is manifestly impossible to do this with absolute certainty without an exploratory curetment. However, when the leukorrheal discharge is scant and tenacious, it may fairly be assumed that the cervix alone is involved; and in such cases the applications are made only to the cervix.

In nulliparas it may be necessary to incise the external os in order to make frequent and thorough applications.

The secretions which adhere tenaciously to the cervical mucous membrane are first wiped away with swabs of sterile cotton, and then astringents and antiseptics are applied. A 1% to 5% silver nitrate solution may be so applied two or more times a week, or the cervix may be packed with a gauze strip saturated with 5% to 10% ichthyol in glycerin. In my judgment the most efficient remedy is 10% to 40% formalin introduced on a swab. When the endometrium of the body of the uterus is involved, the procedure in general practice is to curet the entire endometrium and follow with an antiseptic swab. My preference is for pure formalin.

Injections into the uterine cavity of mild antiseptics and astringents have been recommended and extensively used, but the results are at best uncertain and the method not to be advised.

When the appendages are involved, and it is not determined to remove them, curetment will be found not only unsatisfactory in its results because of the almost certain return of the symptoms, but because of the liability to awaken the tubal infection and cause it to extend. A safe rule to follow is that in the presence of infected appendages curetment should not be done except for the control of hemorrhage, and then only with the greatest caution.

Tubes.—During the entire course of acute salpingitis it is imperative to enjoin absolute rest. The patient should be confined to her bed as long as the fever and acute pain continue. During this period all unnecessary examinations and manipulations of all sorts are prohibited for fear of stripping the pus contents of the tubes

into the pelvic cavity. In addition to rest, all such measures for the relief of pain and the depletion of the congested tissues as hot douches, glycerin tampons, the hot hip pack, and hot fomentations to the lower abdomen are to be employed.

When the tubal infection continues to cause serious disturbances, and at intervals of weeks and months is awakened to acute exacerbations, operative measures should be resorted to. But when the diseased tubes exist with little or no discomfort to the individual there is no occasion for operative interference. Here the removal of the tubes alone seldom results in complete relief. Nothing short of the complete extirpation of the uterus and its appendages will promise an ultimate cure. When possible, the ovaries or a portion of them should be saved. The choice between a vaginal and abdominal operation will largely depend upon the extent of the adhesions, with preference for the vaginal route when possible.

FOREIGN BODIES IN THE BRONCHI.¹

BY

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The glottis is guarded by muscles which contract upon the slightest irritation, preventing in the vast majority of instances the entrance of foreign bodies into the air-passages. Anything, therefore, which lessens the irritability or reflex activity of these muscles tends to allow the inspiration of what, at the time, may be in the mouth or throat. Thus, paralyzes, various forms of intoxication, sleep, violent paroxysms of coughing or laughing have frequently caused the accident. It is unnecessary to explain why children furnish the larger number of cases.

As a rule, the body, after passing the glottis, drops or is drawn down through the trachea into the bronchi until it finds a resting place in a tube corresponding in size to its own. It may stop at first in the trachea and later fall into a bronchus, or it may be cast about for some time until it becomes fixed.

The right bronchus, because of its greater size and because it is a continuation of the trachea, i.e., comes off the trachea at a less acute angle than the left, is more often entered. Occasionally a foreign body at first finds a resting place on one side of the chest and at a subsequent examination it will be found to have shifted to the other.

As a clear understanding of the topography of the bronchi is of advantage in considering this subject, I shall briefly run over the important points. The trachea after entering the thorax is pushed slightly to one side by the aorta so that the bifurcation lies behind a point just internal to the junction of the second right costal

¹ Read before the District of Columbia Medical Society, October 4, 1905.

cartilage with the sternum. In children, owing to the more horizontal direction of the ribs, this point is a costal cartilage lower, the third. From behind the bifurcation is opposite the plate between the fourth and fifth dorsal vertebrae, nearly on a level with the fourth dorsal spine. This point is not absolutely fixed, as it is influenced by the position of the head and neck and by the respiratory movements.

The right main bronchus has a more vertical direction than the left, it is 2.4 cm. long and 2.3 cm. in diameter. The left is 5.1 cm. long and 2 cm. in diameter. Each bronchus may be regarded as a main trunk extending down into its respective lung, giving off numerous branches and becoming progressively smaller. There is but one eparterial bronchus—that supplying the upper lobe of the right lung, all others being hyparterial, *i.e.*, come off below the crossing of the pulmonary arteries. The hyparterial branches are given off in two rows, one dorsal and one ventral. These branches are not directly opposite to each other, the ventral being somewhat more external and posterior. As a rule the dorsal branches are shorter and smaller than the ventral. There are as a rule four dorsal and four ventral branches to each stem bronchus, but not rarely, there is an extra dorsal branch on the right bronchus known as the heart bronchus. The stem bronchi may be said to end anteriorly on the right at a point where the parasternal line crosses the fifth rib and on the left under the fifth rib just inside the mammary line. Posteriorly the right bronchus runs from a point just to the right of the fourth thoracic spine to a point beneath the eighth rib, 5 cm. from the vertebral spine, the left from the same point above to a point under the eighth rib, 7.5 cm. from the spine.

Classification.—Since the treatment in these cases depends, to some extent at least, upon the physical characteristics of the foreign body inspired, some classification is advisable. The divisions here followed are practically those of Hoffmann: (1) Smooth round pieces of metal or glass (coins, bullets, etc.). (2) Hard, irregular, sharp pointed bodies (needles, bones, etc.). (3) Fruit seeds which do not swell on soaking. (4) Bodies which swell on soaking (nuts, some fruit seeds). (5) Soft rough bodies (heads of grain). (6) Miscellaneous (all other bodies).

I have tabulated 50 cases, not heretofore brought together. No attempt has been made to collect every case reported since Hodge's collection supplementing Hoffmann's in Nothnagel's Encyclopedia, nor are any included except cases of foreign bodies in the bronchi.

SMOOTH ROUND PIECES OF METAL OR GLASS (COINS AND BULLETS, ETC.).

CASE 1.—Child, aged 7. Foreign Body: Doll's glass eye. Location: Air-passages. There were no alarming symptoms. On the twenty-fifth day the child coughed more violently than usual and suddenly expired.

CASE 2.—Child, aged 2¾ years. Foreign Body: Glass bead. Location: Right bronchus. Symptoms: Immediate coughing and choking. Numerous paroxysms of coughing for ten days, nearly causing suffocation. Fever, restlessness. Physical Signs: Weak breathing over left chest, changing on the fourth day to the right with improvement of symptoms. Treatment: Tracheotomy, extraction from right bronchus. Result: Recovery.

CASE 3.—Man, aged 35. Foreign Body: Silver dime. Location: Right bronchus. Symptoms: Not noted. Physical Signs: Röntgen ray showed dime to right of median line, opposite fifth costamanubrial junction. Treatment: Low bronchoscopy. Removal with forceps. Recovery.

HARD, IRREGULAR, SHARP POINTED OBJECTS (NEEDLES AND BONES, ETC.).

CASE 4.—Man, aged 22. Foreign Body: Collar button. Location: Left bronchus. Symptoms: Soreness in neighborhood of second rib, immediate hemoptysis. Peculiar squeak to breath sounds. Next day pneumonia of left lung lasting one month. Frequent choking attacks. Continuous cough, fever and pain to left of sternum, second interspace. Anemia, edema of feet, dyspnea on exertion. Occasional faint traces of blood in sputum. Physical Signs: Fourteen months after accident feet swollen, dyspnea. Little movement of chest, with retraction of left side, heart displaced, left lung consolidated. Breathing exaggerated over right lung. Röntgen ray showed dense shadow all over left side. No foreign body seen. Treatment: Upper bronchoscopy fourteen months after accident. Removal of what was thought to be the button surrounded by necrotic tissue. Result: Recovery.

CASE 5.—Boy, aged 13. Foreign Body: Pin wrapped in yarn. Location: Left bronchus. Symptoms: No special discomfort, only slight cough. Physical Signs: Respiratory movement deficient over left lung, breath sounds much less distinct, bronchial rale was heard. No dulness. Röntgen ray showed pin in left bronchus. Treatment: Upper bronchoscopy. Removal at first attempt large part of the yarn. At second attempt removal of pin. Result: Recovery.

CASE 6.—Girl, aged 5. Foreign Body: Piece of metal from suspender fastener, 2.5 cm. long and 6 mm. wide. Location: Right bronchus. Symptoms: Persistent cough; later purulent expectoration. Much pain in right side near sternum; inability to lie down, weakness and paleness; some edema of extremities, fever. Physical Signs: Consolidation of right lung. Röntgen ray showed piece of metal behind anterior end of fifth rib on right side. Treatment: Upper bronchoscopy two months after accident. Removal. Result: Lung still consolidated when discharged.

CASE 7.—Child, aged 27 months. Foreign Body: Sleeve button. Location: Right bronchus. Symptoms: Immediate coughing and suffocation, followed by calm and sleep. Treatment: Low tracheotomy; dislodgment of object with probe. Cough brought button into trachea. Finally removed through mouth. Result: Recovery.

CASE 8.—Boy, aged 13. Foreign Body: Pebble. Location: Right bronchus. Symptoms: Immediate coughing spell; three weeks later high fever, sputum blood-stained. At the end of two weeks temperature fell to normal. Physical Signs: Impaired percussion note over entire right lung; vesicular murmur deficient; moist

rales over apex. Left lung almost normal. Coughed up foreign body. Result: Recovery.

CASE 9.—Child, aged 2½. Foreign Body: Stone 2 cm. long. Location: Right bronchus. Symptoms: Paroxysm of suffocation followed by a calm night. One week later breathing light with inspiratory effort. Physical Signs: Percussion note clear, respiration only slightly vesicular on right side behind bifurcation of trachea. Treatment: Tracheotomy. Removal. Result: Recovery.

CASE 10.—Child, aged 2. Foreign Body: Quill. Location: Right bronchus. Symptoms: Continued paroxysms of coughing. Sputum became putrid. Physical Signs: Sibilant rales gradually appeared in right lung and respiratory murmur became weaker. Treatment: During examination of larynx suffocation threatened and tracheotomy was done. Foreign body was not found. Three months later an attempt at bronchoscopy was unsuccessful because of amount of pus which obscured the field. A second attempt was successful. Result: Recovery.

CASE 11.—Child, aged 8. Foreign Body: Nail. Location: Right bronchus. Symptoms: Bronchitis. Physical Signs: Those of a right-sided bronchitis. Röntgen ray showed nail in right bronchus. Treatment: About one month after accident upper bronchoscopy. Removal. Result: Recovery.

CASE 12.—Child, aged 18 months. Foreign Body: Nail. Location: Right bronchus. Treatment: Tracheotomy. Extraction with electromagnet. Result: Recovery.

CASE 13.—Child, aged 22 months. Foreign Body: Shawl pin. Location: Right bronchus. Symptoms: Found choking and cyanosed. Frequent attacks of choking and coughing. Physical Signs: Examination negative. Röntgen ray showed pin, head down, in right bronchus. Treatment: Tracheotomy. Removal. Result: Recovery.

CASE 14.—Woman, aged 24. Foreign Body: Pin. Location: Left bronchus. Symptoms: Thinking pin had been swallowed she induced emesis which was immediately followed by pain in chest and hemoptysis. Physical Signs: Röntgen ray showed pin on left side opposite fourth interspace. Treatment: Introduction of bronchoscope caused such alarming symptoms that tracheotomy was done. The pin was removed later by low bronchoscopy, in the meantime it having taken a higher position. Result: Recovery.

CASE 15.—Woman, aged 44. Pin, 5 cm. long. Location: Left bronchus. Symptoms: Pin inspired while coughing. Pricking sensation in chest, severe cough, bloody expectoration. Pain in left chest for 15 days, sometimes rising to larynx. Then choking and strangulation occurred. Physical Signs: On the fifteenth day there was dulness over the base of the left lung, with fine rales. Nothing in larynx or trachea. Coughed into larynx and removed. Result: Recovery.

CASE 16.—Girl, young. Foreign Body: Curet. Location: Right bronchus. Symptoms: No cough, no distress. (Curet accidentally dropped in trachea by surgeon operating on larynx.) Physical Signs: Physical examination negative. Röntgen ray showed instrument, 5 cm. long, near right border of sternum on level with third rib. Treatment: Extraction through larynx after feeling for it with forceps. Result: Recovery.

CASE 17.—Woman, aged 40. Foreign Body: Molar tooth. Location: Right bronchus. Symptoms: A week later, high fever. Physical Signs: Respiratory murmur

much diminished over entire right lower lobe with moist rales over this area. Treatment: Tracheotomy. Extraction through funnel. Result: Recovery.

CASE 18.—Soldier. Foreign Body: Nail. Location: Air-passages, left side. Symptoms: Pain in left side with fever and prostration, cyanosis, dyspnea, hemoptysis, cough, mucopurulent sputum. Small pleuritic effusion. Physical Signs: Dulness over left base posteriorly, diminished vesicular murmur, fine friction rales. Autopsy showed a nail near the base of the left lung. Probably inspired many years before during an epileptic fit.

CASE 19.—Child, aged 4. Foreign Body: Breastpin. Location: Air-passages. No cough. Physical Signs: Weak respiratory sound on left. Röntgen ray showed nothing. Coughed up after six months. Result: Recovery.

CASE 20.—Child, aged 10. Foreign Body: Pin. Location: Left bronchus. Symptoms: Immediate severe cough, paroxysms continuing the next day. In one week fever. In two weeks purulent expectoration. Physical Signs: Six weeks after accident abscess was diagnosed by puncture. Röntgen ray negative at first, but later showed pin near fifth rib. Treatment: Inferior tracheotomy. Extraction. Result: Death.

CASE 21.—Girl, aged 17. Foreign Body: Glass-headed pin. Location: Right bronchus. Symptoms: Cough for three days, afterward slight symptoms for one month. Then cough grew worse. Could feel pin move about in air-passages, and once coughed it up into larynx. Sensations always to right or center of sternum. Dyspnea on lying down. Sputum abundant and sometimes contained blood. Physical Signs: Röntgen ray on three occasions failed to show anything; at last it showed pin on line between second and third ribs anteriorly, ¾ cm. to right of median line—head downward and outward. Treatment: Extracted with bronchoscope. Result: Recovery.

CASE 22.—Patient, aged 51. Foreign Body: Bone. Location: Right bronchus. Symptoms: Choking and dyspnea. Passage of probang down esophagus gave relief. Several weeks later cough. After six or eight weeks sputum became free and fetid. Two years later several severe attacks of hemoptysis. Physical Signs: Feeble respiratory murmur over right scapula. One year later area of dulness in right interscapular region. Respiration weak and semibronchial. Röntgen ray showed a shadow to right of cardiac shadow. No tubercle bacilli in sputum, but numerous micrococci. Gradually developed pneumothorax followed by effusion. Autopsy showed right lung perforated and collapsed. In the right main bronchus a piece of bone; the surrounding area ulcerated. The bronchi below were cylindric, congested and contained fetid material. The tissue of the right lower lung had undergone fibrosis. In left lung septic pneumonia.

CASE 23.—Patient, aged 60. Foreign Body: Bone. Location: Right bronchus. Symptoms: Immediate paroxysm of coughing and suffocation. For several days violent coughing spells with intermediate periods of calm. Faintness, oppression, hemoptysis. Physical Signs: Dulness over base of right lung posteriorly. The whole of the middle and lower part of the upper lobe became involved. Foreign body thought to be on a level with spine of scapula. Treatment: Low bronchoscopy. Removal. Result: Recovery.

CASE 24.—Man, aged 49. Foreign Body: Bone. Location: Left bronchus. Symptoms: Seized with pain on

left side of chest. Coughing spells; high fever developed and fetid breath. Cough dry. Physical Signs: At left scapular angle moist rales with weak respiratory murmur. On right side sounds normal. Röntgen ray showed infiltration of whole left lung. Autopsy, twenty-four days after accident, showed bone 2 cm. long in left bronchus; gangrene of the left and edema of the right lung.

CASE 25.—Patient, aged 45. Foreign Body: Canula. Location: Right bronchus. Symptoms: Marked cyanosis, loud stridor. (Canula worn because of former tracheotomy.) Physical Signs: Sibilant rales over entire right lung; left almost normal. Treatment: Tracheotomy. Removal. Result: Recovery.

CASE 26.—Boy, aged 3. Foreign Body: Cartridge shell. Location: Right bronchus. Symptoms: Difficult breathing, fever, rapid pulse. Physical Signs: Weaker breathing and moist rales on right. Röntgen ray showed cartridge in fifth interspace, just to right of sternum. Treatment: No operation. Result: Death.

CASE 27.—Woman, aged 50. Foreign Body: Bone. Location: Air-passages. Symptoms: Voice hoarse, dyspnea with indications of constriction on inspiration. Laryngoscopy showed bone in trachea. During examination bone was drawn into bronchus. Symptoms promptly subsided. Physical Signs: Röntgen ray negative. Coughed up after three months. Result: Recovery.

CASE 28.—Child, aged 1½. Foreign Body: Nail. Location: Right bronchus. Symptoms: Cough and fever. Physical Signs: Respiratory murmur not so clear over right lower lobe. Röntgen ray showed nail on right about fifth to seventh rib. Treatment: Tracheotomy. Removal. Result: Recovery.

CASE 29.—Boy, aged 4½. Foreign Body: Stick. Location: Right bronchus. Symptoms: Spasmodic cough, anxious expression, clutching at throat, fever. After two weeks symptoms less intense. High irregular fever, mucopurulent sputum occasionally blood-stained. Physical Signs: Rales on right side. Röntgen ray showed stick on right. Some time later coughed up. Result: Recovery.

CASE 30.—Child, aged 8. Foreign Body: Piece of wood. Location: Air-passages. Symptoms: Immediate symptoms slight. Physical Signs: Röntgen ray negative. Coughed up after nine days. Result: Recovery.

BODIES THAT SWELL IN WATER.

CASE 31.—Boy, aged 5. Foreign Body: Bean. Location: Right bronchus. Symptoms: Severe cough during first day; night restless and sleepless. Next day breathing stertorous, more pronounced during inspiration. Face deeply flushed, pulse 156, temperature normal. Physical Signs: Percussion normal on both sides, but vesicular murmur almost imperceptible on right. Sibilant rales on both sides. Treatment: Tracheotomy. Removal. Result: Recovery.

CASE 32.—Child, aged 3. Foreign Body: Bean. Location: Left bronchus. Symptoms: Suffocation and cyanosis; temperature normal. Physical Signs: No respiratory murmur heard on left. Percussion normal. Next day indications of infiltration of left lower lobe. Tracheotomy, unsuccessful. Autopsy showed bean in left bronchus; atelectasis and collapse of whole of left lung.

CASE 33.—Infant, aged 21 months. Foreign Body: Peanut kernel. Location: Right bronchus. Symptoms: Paroxysms of dyspnea and coughing. Four days later tracheotomy for dyspnea. Five days later temperature

102°; pulse 140; respiration 40. Physical Signs: Numerous moist rales throughout both lungs. Lessened expansion on the left, but respiratory murmur was louder on left. Treatment: Tracheotomy on fourth day. Some days later an endoscope was introduced through the wound, foreign body located and extracted. Result: Recovery.

CASE 34.—Girl, aged 2. Foreign Body: Grain of corn. Location: Right bronchus. Symptoms: Immediate coughing and dyspnea. Eleven days later high fever, rapid pulse and respiration. Physical Signs: Those of pneumonia of left lung. Treatment: Operation, refused. Result: Death.

CASE 35.—Boy, aged 3. Foreign Body: Bean. Location: Left bronchus. Symptoms: Was thought to have inspired a cherry stone. That afternoon slight croup. Next day sudden dyspnea, cyanosis and great depression. Physical Signs: Sonorous rales over a small area posteriorly. Respiratory murmur very weak. Treatment: Tracheotomy. Bean removed, no cherry stone found. Result: Recovery.

CASE 36.—Girl, aged 6. Foreign Body: Bean. Location: Right bronchus. Symptoms: Immediate paroxysm of coughing. Afterward respiration fell below normal. Next day fever. Physical Signs: Loud stridor in right bronchus; respiratory murmur weakened over entire right lung. Pneumonic signs over right base. Treatment: Tracheotomy on third day; introduction of funnel; extraction. Result: Recovery.

CASE 37.—Girl, aged 13½ months. Foreign Body: Bean. Location: Right bronchus. Symptoms: No fever. Physical Signs: Weak breathing and dulness on right. Treatment: Upper bronchoscopy; partial removal. Tracheotomy. Result: Death.

CASE 38.—Boy, aged 9. Foreign Body: Bean. Location: Right bronchus. Symptoms: Marked dyspnea. Physical Signs: Absence of respiratory murmur over right lung. Treatment: Tracheotomy; bean not dislodged. Four days later extracted after repeated efforts. Result: Death.

CASE 39.—Girl, aged 6. Foreign Body: Bean. Location: Right bronchus. Symptoms: Immediate coughing and choking. In twenty-four hours fever, dyspnea and frequent pulse. Physical signs: Left lung seemed more involved than right. Treatment: Tracheotomy. Object located by probe. Coughing shifted it to trachea, from which it was removed. Result: Recovery.

CASE 40.—Girl, aged 14. Foreign Body: Peanut kernel. Location: Right bronchus. Symptoms: Immediate violent cough, whistling sound audible to those about her. Physical Signs: Prolonged whistling, moaning sound all over chest, loudest just above nipple on right side and at same level posteriorly. Coughed up after about three weeks. Result: Recovery.

CASE 41.—Boy, aged 5½ years. Foreign Body: Peanut kernel. Location: Right bronchus. Symptoms: Immediate violent paroxysm of coughing and choking, followed by exhaustion and sleep. Loud wheezing audible to those about him. Next day developed hectic fever which continued two months. Repeated coughing and choking paroxysms. Hemoptysis. Physical Signs: Breath sounds very weak on right side, exaggerated on left. Small atelectatic area extending from the angle of the right scapula to the liver. Six weeks after accident röntgen ray showed shadow to right of sternum opposite fourth to fifth rib anteriorly. Four weeks later shadow had disappeared. Treatment: Upper bronchoscopy at-

tempted. Instrument too large. Recovery after two months. Nut probably disintegrated and coughed up. Result: Recovery.

FRUIT SEEDS THAT DO NOT SWELL IN WATER.

CASE 42.—Boy, aged 6. Foreign Body: Plum seed. Location: Left bronchus. Symptoms: Immediate coughing and suffocation followed by paroxysmal cough. Treatment: Low tracheotomy. Extraction with probe. Result: Recovery.

CASE 43.—Child, aged 1½. Foreign Body: Orange seed. Location: Left bronchus. Symptoms: Cyanosis and dyspnea. Next day severe cough. Physical Signs: Faint respiratory murmur. Treatment: After two days tracheotomy. Extraction. Result: Recovery.

CASE 44.—Child, aged 5. Foreign Body: Cherry seed. Location: Right bronchus. Symptoms: Cough, dyspnea and threatened convulsions. Cough disappeared at end of a week. Temperature not above 101°. After four weeks sputum became mucopurulent. Coughed up after six weeks. Result: Recovery.

CASE 45.—Child, aged 5½. Foreign Body: Prune seed. Location: Right bronchus. Symptoms: Suffocative attacks followed by a period of calm. Pneumonia on fifth day. On fifteenth day violent crisis of suffocation. Treatment: Tracheotomy. Later seed found at autopsy.

CASE 46.—Child, aged 6. Foreign Body: Prune seed. Location: Air-passages. Symptoms: Immediate suffocative attack; face pale, expression agonized. Next day dyspnea and paleness. Physical Signs: Slight slapping sound heard over trachea. Vesicular murmur impaired and moist rales present. Treatment: On second day tracheotomy and canulation; nothing felt. On third day seed expelled through wound. Result: Recovery.

SOFT ROUGH BODIES (HEADS OF GRAIN).

CASE 47.—Boy, aged 4. Foreign Body: Head of barley. Location: Right bronchus. Symptoms: Immediate fit of coughing; next day quite well, but on third day depressed; fourth complained of something sticking him in right side; fifth day severe cough with hemoptysis. Symptoms of gangrene of the lung developed. Physical Signs: A week after accident, breathing frequent, respiratory sounds almost wholly absent over lower right lobe; over rest of chest sounds exaggerated. Autopsy showed gangrene of right lower lobe and gangrenous pneumonia of right middle lobe. Among clots and debris was found a head of barley 4 cm. long and a small detached fragment.

CASE 48.—Patient, aged 18. Foreign Body: Head of timothy. Location: Air-passage. Symptoms: Fell over, but revived shortly. Severe bronchitis with hemoptysis. Tuberculosis diagnosed by several. Physical Signs: Those of bronchitis. Coughed up 2½ months later. Eighteen years after accident healthy except for bronchorrhea.

CASE 49.—Child, aged 8 months. Foreign Body: Spike of rye. Location: Left bronchus. Symptoms: While in vigorous health suddenly seized with paroxysms of coughing like pertussis, abundant hemoptysis, vomiting, diarrhea and fever. Physical Signs: Negative until third day, when they were those of a localized bronchitis to the inner side and below the point of the right scapula. On fourth day signs of bronchopneumonia. By the eighth day an abscess had developed in this area.

Treatment: Opened between eighth and ninth ribs, and spike of rye 6 cm. to 7 cm. removed from the cavity. Result: Recovery.

MISCELLANEOUS BODIES.

CASE 50.—Child, aged 10 months. Foreign Body: Orange pith. Location: Right bronchus. Symptoms: Dyspnea, cyanosis, cough. Physical Signs: On right side normal respiration replaced by a weak inspiratory sibilant rale. Breath sounds exaggerated on left side. Treatment: Low bronchoscopy. Body seen with one end impacted in right bronchus and the other resting against the opposite wall of the trachea. Extracted. Result: Recovery.

Of the 50 cases, 38 subjects recovered and 12 died, a deathrate of 24%; the statistics as a rule show about 33%. The improvement may be attributable to the recent introduction of the bronchoscope. Of 33 patients operated upon, 28 recovered and 5 died, while of 17 not operated upon 10 recovered and 7 died.

In Class 1, there were three cases, 2 patients were successfully operated upon; 1 not operated upon died. In Class 2, there were 27 cases, 17 patients were operated upon, with 1 death; 10 were not operated upon, 6 recovered, 4 died. In Class 3, there were 11 cases, 8 patients were operated upon, 5 recovered, 3 died; 3 were not operated upon, 2 recovered, 1 died. In Class 4, there were 5 cases, 4 patients were operated upon, 3 recovered, 1 died; 1 not operated upon recovered. In Class 5, there were 3 cases, 1 patient was operated upon and recovered; 2 were not operated upon, 1 recovered, 1 died. In Class 6, there was but one case, the patient was operated upon and recovered.

Symptoms.—Cough.—Very rarely there may be no immediate indication of the entrance of a foreign body into a bronchus, but in the majority of cases there is at once a spasmodic effort to expel the intruder. There is violent paroxysmal cough, dyspnea and sometimes fatal suffocation before relief is obtained. Severe paroxysmal cough recurring at intervals is, perhaps, the most constant symptom. In some cases the seizure occurs every few minutes, but more usually there is an interval of hours or days. Perhaps in most instances the initial coughing spell successfully dislodges the foreign body. In children these violent efforts at expulsion are usually followed by great exhaustion and often by quiet sleep. There is generally a slight but frequent cough which continues between the distinct paroxysms.

Hemoptysis.—The occurrence of a pulmonary hemorrhage in a suspicious case is strong evidence of the presence of a foreign body in the air-passages.

Fever.—This symptom is very constant, the type is hectic and probably due to infection from the inflamed area which soon develops around the body. Of course the fever may be due to pneumonia, which is often seen.

Pain.—Sensations of various kinds are at times experienced in the neighborhood of a foreign body, though severe pain is seldom observed.

Dyspnea.—Difficult breathing is often noted immediately after the accident and may be continuous or may be troublesome only during the paroxysms of cough. There may be loss of consciousness if a large bronchus is obstructed. Distress in the epigastrium and vomiting have been observed.

Physical Signs.—The position voluntarily assumed by the patient is worth consideration, as he often takes that which keeps the foreign body stationary, if it be more or less movable. My own patient always slept upon the right side slightly turned toward the front. I believe that it might indicate the location of the foreign body.

If a bronchus of any size is obstructed there is diminished expansion of the affected side. The play of the auxiliary respiratory muscles and *ala nasi*, and other evidences of dyspnea, may be noticeable.

The most characteristic of the possible results of the presence of a foreign body in a bronchus is an atelectatic area. Over such an area there is lessening or absence of tactile fremitus (this being of importance as a distinction from consolidation); dulness more or less distinct; a very weak respiratory murmur or even bronchial breathing.

Whether there be any atelectasis or not, there is weakness or absence of respiratory sounds on the affected side and exaggerated breathing on the sound side. Rales may or may not be present; when the examination is made soon after the accident they are usually of the dry variety and may be very suggestive. One case is on record, in which the object inspired was a whistle resulting in the blowing of this instrument with each respiration.

Röntgen Ray.—The röntgen ray should always be tried as an aid to diagnosis, for if the foreign body does cast a shadow its presence is assured, and even if it does not, the infiltrated area which is so prone to form about the object may be seen. Unfortunately the absence of a shadow cannot always be taken as positive evidence of the absence of a foreign body. Even metallic objects have failed to cast a shadow on several reported occasions. When sepsis develops there is leukocytosis.

Ultimate Results.—If the sufferer survives the first twenty-four hours complications are likely to develop. Bronchitis is practically certain to result. If the foreign body happens to be septic, infection is almost inevitable, but even if comparatively clean its presence sets up inflammatory changes in the mucous membrane of the bronchi, allowing of an infection by the organisms, often if not always to be found in the air-passages.

Pneumonia is, according to some observers, an almost certain result, and unfortunately is frequently septic; abscess and gangrene are hence natural consequences. Pleurisy is not common. Bronchiectasis may result from the more or less complete obstruction of a bronchus.

One of the most important consequences is a cirrhotic change which takes place in the affected bronchus and the surrounding lung tissue. This process may be very

slight or it may reach the enormous extent of an entire lung. Many cases are on record in which a foreign body has remained in the lungs for months and years. The symptoms are usually those of pulmonary tuberculosis, *i.e.*, chronic cough with perhaps hemoptysis from time to time, progressive loss of flesh and strength, finally ending in death or the expulsion of the foreign body.

Treatment.—The treatment may be considered under three headings: (1) Position; (2) operation; (3) expectant. By position alone or aided by induced vomiting an attempt is made to dislodge the foreign body and favor its escape through the glottis. This method cannot be recommended, because there is a decided element of danger. The glottis being the narrowest portion of the passage to the bronchi is the point at which a body is most likely to be caught. The fact that it has already passed this constriction is not sufficient argument in favor of its safe return. The important thing to remember is that whether the object be smooth or rough as soon as it reaches the area beneath the vocal cords there is a contraction. This reflex may, of course, be controlled by previous cocaineization. Children may be held by their feet and slapped on the back; adults may be laid across a chair, bench, or bed, with the hands on the floor, the head and upper part of the body inclining downward, and told to cough. The Padley method consists of seating the patient upon a bench with his knees hooked over the end. The end is then elevated about two feet from the floor, the patient having taken a deep breath is suddenly thrown backward and told to cough. (Ingals.) The efforts at expulsion may be reinforced by the administration of emetics.

Objects of the first class (smooth and round) are the ideal ones for the treatment by position. Dr. Frank Leech, of this city, told me of an instance in which a woman had inspired a pea in which he, after about two hours' work, succeeded in dislodging the foreign body by this method.

In my opinion, this plan of treatment should only be attempted when an operator is at hand to do a tracheotomy should suffocation threaten.

Operation has many advantages and commends itself to most of us. The chief argument which is advanced against it is that in a certain percentage of cases spontaneous expulsion of the foreign body results in recovery. Since the introduction of the bronchoscope operations have been much more successful. This instrument, which has not come into general use as yet, consists of a series of tubes of varying sizes and lengths, which can be passed down the trachea and into the bronchi, either through the mouth and larynx or through a tracheal incision. The light is thrown into the tube by a head-mirror, or, which is a much better method, an electric light similar to that used in a urethroscope is used. By means of this instrument the tertiary bronchi may be explored, the bronchi being so elastic that it is possible to bring them

into the straight line of vision. The foreign body may then be removed by means of instruments devised for the purpose.

For the introduction of this instrument through the larynx (upper bronchoscopy) a skilled laryngologist is necessary, while the introduction through a tracheal incision (low bronchoscopy) is much simpler. Even in the hands of the thoroughly competent the latter operation is preferred for those under ten years.

In this connection it may be mentioned that Ingals has called attention to a contraction and expansion of the bronchi during respiration.

Tracheotomy has been resorted to many times, but with only fair success. Before the introduction of the bronchoscope it was customary to feel around the bronchi through the tracheal wound with a probe in the hope of finding and extracting the body or at least dislodging it so that it might be coughed up. Tickling with an oiled feather has been advocated as much less dangerous than the use of a probe.

No successful opening of a bronchus through the chest wall for the removal of a foreign body has come to my notice, and it is looked upon as impracticable by most surgeons.

If an abscess forms or if gangrene develops the condition is, of course, treated by incision through the chest wall. Numerous cases are on record in which the foreign body has been found and removed under such circumstances.

The expectant plan is fraught with many dangers and greater anxieties for those most interested in the patient. Our hope here is that the foreign body will eventually be coughed up either in its entirety or in a disintegrated form, or that it may be absorbed, or that it may undergo some change by which it will cease to act as an irritant. The hope for spontaneous expulsion is far greater in case of smooth round bodies than when they are rough and irregular. The possibility of disintegration and expulsion in small particles is certainly worth considering in case of nuts devoid of shell.

With a view to determining what the effect of soaking would be upon peanuts I carried on some very simple experiments with the following conclusions: The ordinary entire cooked peanut kernel, when totally submerged for twenty-six days, crumbled on pressure in much the same way that a piece of bread would do when thoroughly soaked. The same was true, though to a lesser degree, of pieces of kernel which were kept wet, but at the same time exposed to the air, while an unbroken half kernel, under the latter condition, was still quite firm at the end of the period.

While it is, of course, impossible to reproduce the exact conditions as would exist in the lung, it seems reasonable to suppose that a body in a bronchus would be kept constantly wet and at the same time be exposed to the air.

In view of these facts the treatment, in cases in which nuts devoid of shell happen to be the foreign bodies, might be somewhat modified. There is, however, always the possibility that the body may be coughed up and lodging in the upper passages cause suffocation, or that death may result from pneumonia, abscess, or gangrene, or that chronic cirrhotic processes may be set up, or that the obstruction. Bronchoscopy should be resorted to promptly in the vast majority of cases.

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ACTINOMYCOSIS LIMITED TO THE URINARY TRACT.

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Actinomycosis limited to the urinary tract is of exceedingly rare occurrence. In a careful search of the available literature on human actinomycosis, an instance of such localization has not been found. It seems advisable therefore to record a case in which an actinomycotic lesion was limited to the kidney and bladder.

Actinomycosis involving the kidney as an incidental lesion in the pyemic form of the disease is by no means uncommon, cases of this type having been reported by Ruhrah,¹ Mallory,² Kobler,³ and others. Both the kidney and bladder may be involved by the direct extension of lesions originating in other organs, the most frequent source being the gastrointestinal tract. Such cases have been reported by Billroth,⁴ Bell,⁵ and others.

The case here reported was clinically one of cystitis and pyelonephritis. The actinomycotic character of the kidney lesion was not recognized during life or at the time of the autopsy; but was discovered only upon histologic examination of the kidney. For this reason it has been impossible to determine definitely certain points which might have an important bearing on the unusual localization of the lesions.

Case. Records of the Bender Laboratory, Autopsy No. 839.

Clinical history:—Mr. W., white, aged 53, shoemaker, was admitted to St. Peter's Hospital, January 7, 1905, service of Dr. Henry Hun. Family history:—Negative. Personal history:—Always healthy. He uses alcohol to excess. Denies venereal history. Present illness:—About two months before admission to the hospital, the patient began to have difficulty in passing his urine. He could pass only a small amount at one time and the stream was small. For some time before admission he had been troubled with dribbling of urine over which he had no control. The passage of urine caused a burning sensation.

Physical examination:—Patient well developed. Pupils unequal, the left being irregularly dilated. Tongue enlarged, flabby, has fine tremor and is covered with white fur. Lungs resonant. Expiratory murmur prolonged. Heart sounds rather faint but otherwise normal. Abdominal examination negative. Bladder somewhat distended. Knee-jerks present.

Urinary examination:—January 8, specific gravity 1,020; acid; cloudy; trace of albumin; no sugar; many leukocytes and epithelial cells. January 23, specific gravity 1,010; acid; cloudy; many pus cells. Blood-examination:—January 23, hemoglobin 45%; leukocytes 6,000. Sputum examination:—Many encapsulated diplococci. No tubercle bacilli found.

While in the hospital the patient ran an irregular temperature ranging from 99° to 103°, and was slightly irrational the greater part of the time. In addition to the bladder symptoms he had a slight cough.

The treatment was purely symptomatic.

Autopsy:—Made by Dr. Stanton 18 hours after death.

The body is that of a large-framed, poorly nourished adult male. Length of body 167 cm. Rigor mortis present. No edema. Pupils unequal. Skin of a uniform yellow color, except for moderate reddish discoloration of dependent parts. On the outer aspect of the right thigh 6 cm. below the crest of the ilium is an irregular, depressed, reddish scar.

Abdominal cavity:—No free fluid. Serous surfaces smooth and glistening. The omentum covers the intestines, is rich in fat and is adherent by fibrous adhesions to the left side of the urinary bladder. The appendix points downward and its tip is adherent to the bladder. The transverse colon is adherent to the gallbladder by a few fibrous bands.

Pericardial cavity:—Negative.

Pleural cavities:—Negative except for a few fibrous adhesions at both apices and at base of left lung.

Heart:—Normal in size; pericardium and endocardium normal. Valves negative except for slight thickening at attached borders of aortic valves. The myocardium is firm and brownish red in color. Wall of left ventricle averages 14 mm. to 16 mm. in thickness.

Right lung:—Surface smooth. On section numerous yellowish caseous nodules 1 mm. to 5 mm. in diameter are found at the apex, while in the middle lobe are many closely arranged recent tubercles 2 mm. to 4 mm. in diameter. These have a distinctly peribronchial arrangement. The lower lobe contains many similar nodules. Lung otherwise negative except for moderate carbon pigmentation.

Left lung:—Pleural surface smooth except at apex and along posterior surface where there are a few fibrous tags. The apex is puckered, containing a distinctly encapsulated caseous nodule 1 cm. in diameter, surrounded by a number of small firm nodules. Scattered throughout the remainder of the lung are nodules similar to those in the right lung.

Spleen:—Weight 240 grams; capsule smooth; cut surface dark red in color; trabeculas distinct; follicles indistinct.

Liver:—Weight 1,500 grains. The capsule is negative except for a few thickened, slightly wrinkled areas on the upper anterior surface of the lower lobe. On section the cut surface shows red and grayish-yellow mottling; the darker areas correspond to the centers of the lobules. Gallbladder and ducts normal.

Gastrointestinal tract:—The stomach is dilated; its mucosa smooth, pale and covered with a thick tenacious mucus. The remainder of the gastrointestinal tract is negative except for a small pit-like depression in the middle of the transverse colon, which represents apparently a healed ulcer.

Right kidney:—Weight 230 grams. The capsule strips with some difficulty, leaving an exceedingly pale grayish-yellow cortex with deeply injected stellate veins. On section the pelvis is filled with a thin grayish-yellow purulent fluid. The pyramids and adjacent cortex are streaked by grayish-yellow lines of purulent infiltration. In many places the areas of suppuration are confluent, forming abscesses 0.5 cm. to 1 cm. in diameter filled with a thick pus containing fragments of necrotic tissue. The ureter contains a thin cloudy fluid.

Left kidney:—Weight 160 grams. The capsule strips with some difficulty, leaving a coarsely lobulated pale-yellow surface. On section the cortex is seen to be markedly thinned. The cut surface is pale-yellow in color and has a glistening appearance. The iodine reaction is negative. Ureter normal.

Urinary bladder:—The wall is very greatly thickened and is firmly bound to the pelvis on the right posteriorly by dense connective tissue, containing islands of fatty tissue. On removing the bladder numerous pus cavities are opened, a thick yellow pus escaping. The mucosa of the bladder, which shows irregular losses of substance, is slightly granular and has a mottled grayish-yellow color. The cavity of the bladder is filled with a thick mucoid pus and many of the pus-containing pockets opened in removing the bladder are found to communicate with the bladder, being apparently diverticula.

Prostate, seminal vesicles and testicles are normal.

Adrenals are normal.

Aorta is normal.

Anatomic Diagnosis:—Chronic ulcerative cystitis. Suppuration in diverticula of bladder. Chronic pericystitis. Pyelonephritis (right). Chronic diffuse nephritis. Pulmonary tuberculosis. Fatty liver with slight chronic passive congestion. Scar of right hip. Scar of old ulcer in colon (?). Chronic peritonitis. Chronic pleuritis.

Bacteriology:—Cultures from right kidney sterile after 48 hours.

Histologic Examination:—Lung:—Sections through the nodular masses show tubercles made up of epithelioid cells, giant cells, and lymphocytes and with central areas of caseation, in and about which are slender beaded bacilli which stain by the Gabbet and Gram-Weigert methods. Careful examination of these many sections revealed no evidence of the presence of actinomyces or other streptothricial forms.

Left kidney:—A few small focal areas in cortex show increase of interstitial tissue with an occasional hyaline glomerulus. Other glomerular tufts in these areas are shrunken and lobulated with wide intracapsular spaces. The cells of the convoluted tubules are swollen and granular. A few hyaline casts are seen in the straight tubules.

Right kidney:—Same chronic changes as in left kidney. In addition sections taken through the abscesses in the pyramids and cortex show irregular areas of suppuration. These areas are composed of polynuclear leukocytes and cell detritus, in the midst of which are seen numerous typical actinomyces colonies with well developed "clubs." The persisting kidney tissues about such areas are diffusely infiltrated with lymphocytes, plasma cells, polynuclear leukocytes and fibroblasts, while surrounding some of the larger abscesses there is a poorly defined zone of highly cellular newly-formed fibrous tissue. In the diffusely infiltrated areas the glomeruli and a large proportion of the tubules can still be made out. The mucosa and submucous tissues of the pelvis are infiltrated with lymphocytes, plasma cells, and fibroblasts. A variety of staining methods, including those for the tubercle bacillus, prove the actinomyces to be the only organism present.

Bladder:—Sections through the ulcerated portions of the bladder wall show an entire absence of epithelium. The mucosa is replaced by granulation tissue, which is exceedingly rich in spindle-shaped cells. On the surface of this tissue is a layer of partially necrotic cellular material containing a moderate number of leukocytes together with large clumps of cocci and a few bacilli. Small areas of necrosis extending into the deeper tissues of the bladder wall. The muscular coat shows a very marked increase of connective tissue of a highly cellular type. Although sections cut from a large number of blocks representing various portions of the bladder wall were examined for actinomyces neither colonies nor filaments could be found. Stains for tubercle bacilli are also negative.

Histologic Diagnosis:—Actinomycosis of right kidney. Chronic ulcerative cystitis with extensive formation of granulation tissue. Slight chronic diffuse nephritis. Pulmonary tuberculosis. Old blood pigment in spleen. Congestion and fatty metamorphosis of liver.

The presence of colonies of actinomyces in the kidney abscesses leaves no doubt as to the nature of the renal lesion. The failure to find either colonies or filaments of actinomyces in the bladder wall, however, raises a

question concerning the character of the bladder lesion. On the other hand the presence of actinomycosis of the kidney and the peculiar character of the histologic changes in the bladder wall indicate the probability that this lesion also is actinomycotic in nature.

The mode of infection in this case is doubtful and it is more than possible that the lesion in the urinary tract was secondary to a primary focus which had existed in some other part of the body but which had disappeared at the time of autopsy. The small scar-like area in the colon, the various peritoneal adhesions, and the old scar on the outer aspect of the right thigh each suggest antecedent inflammatory conditions offering possible routes of infection; but no connection could be traced between any of these and the lesion in the urinary tract. The presence of tubercle bacilli in the lung and the absence of actinomyces disposes of any possibility that the lung lesion might have been the portal of infection.

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PYEMIA, WITH THE REPORT OF AN INTERESTING CASE IN WHICH THE AUTOPSY REVEALED TOXEMIA RATHER THAN PYEMIA.¹

BY

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of Jeffersonville, Ind.

Pyemia being a surgical disease, I will consider it entirely from a surgical standpoint. We can justly claim that the only relief offered is by surgical interference.

Pyemia, as its name implies, was formerly supposed to be a condition in which pus was found in the blood. It is so closely allied to septicemia that it is sometimes difficult to make a differentiation, yet it is probably true that while septicemia is really an intoxication, pyemia is an advanced condition with multiple metastatic abscesses, both being of pyogenic origin. Again, we have a condition in which the symptoms are apparently equally developed and called septicopyemia. In both of these the pyogenic organisms are very active. Of course, pyemia no longer means, as its etiology implies, pus in the blood, but we now understand it to be a form of blood poisoning by pyogenic organism, in which the living bacteria reach distant tissues by means of the blood current, where they multiply and produce abscesses, these multiple abscesses being the typical pathologic feature, while in septicemia the systemic intoxication as the result of the living bacteria in the blood is the characteristic feature, so that at the present time we do not draw that sharp line of distinction between these various forms of pyogenic disease, as we have been

¹ Read before Mississippi Valley Medical Association at its meeting, Indianapolis, Ind., October, 1905.

led to believe by both theory and practice that these conditions are so alike in many features that it is not practical to attempt a distinct separation, but rather to consider them as allied pathologic conditions, the principal difference being the varying degrees of intensity. Scientific research along these lines has been somewhat delayed, as we have in man no specific microorganism of septicemia and pyemia, while on the other hand we do have typical cases of both in the lower animals, from which important lessons are to be learned from a closer study of these pathologic conditions. A great deal of valuable research by some of our pathologists has been made along these lines and much light has been thrown upon the true etiology and pathology of these conditions, until the surgeon has been led to recognize them as almost wholly within his domain, in which assumption he is supported by the searchlight of pathology.

The great length of time which these pyogenic microbes may retain their virulence, together with their widely varying degree of intensity, is such that they may be introduced under varying circumstances which may greatly influence their growth. The result of the introduction of these microorganisms into the tissues is determined by their number and their varying degree of virulency, and may be one of a purely local process or of a general character. It is a wellknown fact that the leukocytes are attracted toward these bacteria with especial force, and that the bacteria are often inclosed by the leukocytes, and if alive at this time, as maintained by Metchnikoff, they may be transported to great distances. Again, it has been frequently demonstrated that living bacteria may pass into the blood through the lymph passages, and that their direct introduction into the lymph spaces by open wounds favors this mode of transmission. On introduction, many of these bacteria quickly reach the nearest lymphatic glands, setting up a lymphangitis, which may go on to suppuration, with one or more abscesses developing in the course of the lymphatics. The typical cases of pyemia are distinguishable clinically from septicemia by the finding of these secondary abscesses, which may, however, be so deep seated in inaccessible viscera that it is sometimes difficult, if not impossible, to determine their existence. As has been said, pyemia differs clinically from septicemia in the formation of these metastatic abscesses. When the abscesses are the result of the lodgment of infected emboli in the vessels and the inflammation rapidly extends to the anemic tissues within the area supplied by the vessel, we have a systemic disturbance, manifested by violent chill with a sudden rise of temperature. These chills are always a true index of the occurrence of embolism, and should serve to direct the attention of the surgeon to the question of pyemia.

It is always well to have fixed in our minds a distinct picture of pyemia, and Bilroth has drawn a most excellent hypothetic case. He recites a case of complicated fracture of the leg just above the ankle, with extensive contusions, the injury being dressed according to the methods of preaseptic surgery. "For the first few days the patient suffers little inconvenience, but later on the wound begins to be inflamed, the skin in the neighborhood becomes edematous and red, with increasing evi-

dences of inflammation resulting in abscesses. At this time the patient suffers a severe chill, high temperature, followed by pronounced sweats. New abscess cavities make their appearance, the chills increase in frequency and severity, other joints finally becoming involved, with metastatic involvement of the chest. The conditions rapidly grow worse, the patient finally becoming unconscious, and the whole picture ending in death."

The foregoing description by Bilroth is particularly applicable in the case of wounds not treated aseptically, while under our present method of aseptic practice pyemia is and should be of infrequent occurrence.

Our greatest achievement in the matter of treatment is our ability to prevent the infection in operative wounds that results in septicemia and pyemia. With a distinct recognition of pyemia as a surgical disease, it becomes our duty to search out when possible these abscess cavities and with no uncertain hand evacuate them wherever and whenever found.

I have recently been called upon to attend a most interesting case of what appeared to be pyemia following operation for appendicitis. It was thought that multiple metastatic abscesses existed in the liver.

The case was that of a boy aged 12, who in the fall of 1903 had a well-defined attack of appendicitis in which immediate operation was advised but not performed. The child recovered and was apparently in his usual health up to the latter part of July of the present year, when he had another attack which finally proved fatal. I did not operate, but the history of the case shows that the operation was not performed until probably 60 hours after the beginning of the attack, when an extensive gangrenous condition of the appendix and surrounding tissues was found, together with extensive adhesions. The patient left the operating-room with a high temperature and rapid pulse, and his general condition bad. During the first week his pulse ranged from 120 to 150, and his temperature from 100° F. to 103° F., with his respirations from 28 to 36. About the twelfth day an accumulation of pus was made out near the median line, and a secondary operation was done, evacuating quite a quantity of pus and establishing free drainage. For a considerable time this continued to discharge great quantities of pus, finally resulting in a fecal fistula. On August 16, the history shows a chill followed by a rise of temperature to 107°, with pulse 180. Following this there occurred chills or rigors at irregular intervals with temperature ranging from 105° to 108° and pulse from 150 to 180 after each chill, while in one instance the thermometer registered 109°. These chills were irregular both in duration and frequency, sometimes occurring as often as two or three in 24 hours. As a rule the high temperature following these rigors was of a very short duration and frequently dropped to subnormal. These chills and temperature were always followed by profuse sweats.

I assumed charge of the case at the beginning of the sixth week, when a diagnosis of pyemia was made, and the use of streptolytic serum was determined upon. Serum of two different makes was tried and given in doses of 10 cc. to 20 cc. every six hours. Under this treatment the chills on two or three occasions were postponed 72 hours, while on another occasion the patient escaped a chill for about 102 hours. During this time the patient's general condition seemed to improve somewhat, and a little brighter view of the case was taken. During the ninth week, however, his case rapidly assumed a hopeless condition, and he died in a paroxysm of vomiting.

The autopsy revealed the existence of adhesions everywhere. That there had been a general purulent peritonitis no one could doubt. Extensive adhesions were found between the intestines, while the left lobe of the liver and the stomach and spleen were all so firmly adhered in a general mass that in the effort to separate them the liver tissue was broken down. In fact, it was scarcely possible to find any place in the abdominal cavity where adhesions did not exist. Several small pockets of pus were found irregularly deposited in the peritoneal cavity on the left side, walled in by the parietal peritoneum and the stomach, left lobe of the liver and spleen. These adhesions were all remarkable for their exceeding firmness and extensiveness, and in many instances it was impossible to break them down without extensive destruction of tissue. At no time after I first saw the patient would it have been possible to have accomplished anything or any good by a free incision for the purpose of evacuating any of these pus cavities. In the first place, it was impossible definitely to outline any of the pockets, and even could this have been done, to have attempted to open up these pus sacks that were so firmly walled in by inflammatory tissue would have resulted in such extensive destruction to the continuity of the various organs involved as would have resulted in his death in a few hours. Ordinarily I advocate a free incision into the abdominal cavity, and washing out well with normal saline solution; but in this particular case there was never a time after assuming charge of the case when any good could have been accomplished by such procedure. The examination of the liver and spleen, as well as other organs, was negative, so that the autopsy, instead of revealing the existence of pyemia, proved the case to have been one rather of toxemia and that these pockets or accumulations of pus were the result of nature's efforts to wall off this pus and protect the system against its absorption.

HAND DISINFECTION.¹

BY

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It is usually quite inappreciable to the student of medicine, and not infrequently also to the busy practitioner, what an amount of care is essential to secure absolute freedom from bacterial infection. Not so much to determine the values of the various more generally used antiseptics and the common methods of cleaning hands, as to impress upon students the necessity for the greatest precautions. Dr. Martin B. Tinker, conducting the Sophomore Class in Surgery at Cornell University, instituted the following experiments which were performed in the bacteriologic laboratory of Cornell University Medical College at Ithaca:

Each student was provided with a sterile, wooden back scrubbing brush, a nail file and cleaner, a sterile orange-wood stick for the roots of the nails, and a tin basin, and later with a sterile towel. After smearing the hand or a few fingers with some bouillon culture of pathogenic bacteria, each student scrubbed in his individual basin with hot tap water and either green soap, ivory soap, or hand sapolio (instead of the marble dust soap recommended by Schleich, of Berlin) for about five minutes, cleaned his nails with an orange stick and

metal file, and scrubbed again for a short time. The hands were then immersed in various antiseptics according to assignment, dried on a sterile towel, and then dipped into a sterile agar plate under the supervision of Dr. Tinker. The plates were then transferred to the incubator, where they were kept for several days at 37° C., with the following results:

I. MECHANICAL METHODS WITHOUT DECIDED DISINFECTANT CHEMICALS.

(a) Hands smeared with *M. pyogenes albus* or *Pseudomonas pyocyaneus*, were scrubbed with green soap and water for from seven to nine minutes, and then rinsed in alcohol, with no culture resulting in three cases, but with contamination in one instance (Martin, Goodwin, and Johnson).

(b) *Schleich's Method*.—The hands were scrubbed for 15 minutes with water and hand sapolio, contamination resulting (Snyder and Cahill).

(c) *Protection with Sterile Gloves*.—After disinfection of the hands by the potassium permanganate mercuric chlorid process described below two members of the class put on supposedly sterile gloves. The plates were contaminated in both cases (Donk and Ray).

II. SINGLE CHEMICAL DISINFECTANTS USED.

(a) *Mercuric Chlorid*.—The hands were smeared with *Pseudomonas pyocyaneus*, scrubbed for five minutes, soaked in mercuric chlorid solution, 1 to 1,000, for five minutes, with no resulting contamination (Sill).

(b) *Carbolic Acid*.—The hands were smeared with *Pseudomonas pyocyaneus*, scrubbed with green soap for six minutes, soaked in 5% carbolic acid for five minutes, with no culture of the organism, but a fungus growth resulting in both cases (F. P. Goodwin and Cuddeback).

(c) *Creolin*.—The hands were smeared with *M. pyogenes albus*, scrubbed for five minutes, soaked in warm solution of 5% creolin, with wellmarked growth in three cases (Markey, Winslow, and Richardson).

(d) *Boric Acid*.—The hands were smeared with *B. coli communis*, *Pseudomonas pyocyaneus*, or *M. pyogenes albus*, washed for five minutes, and soaked for five minutes in a saturated solution of boric acid, with respective culture growth in each instance (Stark, Thro, and Tousey).

(e) *Lysol*.—The hands were smeared with *Pseudomonas pyocyaneus*, washed for five minutes, soaked in lysol solution, 2.5%, and allowed to remain for five minutes, with no culture growth resulting (Dederer).

III. COMBINED CHEMICAL DISINFECTANTS USED.

(a) *Chlorinated Lime and Sul Soda, Followed by Mercuric Chlorid*.—The hands were smeared with *B. coli communis* or *Pseudomonas pyocyaneus*, scrubbed for five minutes with green soap or hand sapolio, rinsed, rubbed for about two minutes with a paste made by moistening powdered sal soda and chlorinated lime, rinsed again, and soaked in mercuric chlorid solution, 1 to 1,000, for five minutes, with no culture in five cases, but contamination in one (Kaufold, Price, Obendorf, Robinson, and Laird).

(b) *Potassium Permanganate, Followed by Oxalic Acid and Mercuric Chlorid*.—The hands were smeared with *Pseudomonas pyocyaneus* or *B. coli communis*, scrubbed for five minutes and soaked in a saturated permanganate solution for two or three minutes until the skin was of mahogany hue, washed in oxalic acid until the stain had disappeared, soaked for about five minutes in mercuric chlorid solution, 1 to 1,000, with no culture in all cases, but contamination in one (Santee, King, and Blum).

It is evident from the foregoing report that the combined methods give the best results, for with both these methods no culture growths were obtained. It may be

¹ An account of experiments performed by the Sophomore Class in Surgery in Cornell University, Ithaca, N. Y., in April, 1904.

that this comes from the somewhat greater care and time demanded in the use of a combination of disinfectants quite as much as from their increased antiseptic value. These methods, on the other hand, were the most injurious to the epidermis, and particularly was this reported by those using the potassium permanganate.

Of the single disinfectants, the carbolic acid and the mercuric chlorid appear safe, but those students who employed the former complained of persistent numbness. Lysol is apparently also trustworthy, and from its saponaceous properties is desirable for such parts, as the vagina, containing abundant secretion. Creolin and boric acid proved unreliable in these experiments.

The green soap and alcohol method appears to be satisfactory, and the experiments, in so far as they go, seem to substantiate the method, which has had a thorough and successful test in the clinics of the late Professor Mikulicz, of Breslau, and Dr. Terrier, of Paris. Schleich's strictly aseptic, mechanical method requires the utmost care for success.

The gloves which had presumably been sterilized, were contaminated; otherwise they are certainly safe.

It is well understood that most of these methods of cleaning the hands have been thoroughly tested by experienced bacteriologists, and that their conclusions are of more value. These experiments, however, were performed in the course of an ordinary lecture hour by a class of about 20 students, and the results reported and discussed during another lecture period. Of course, few rooms are more favorable for contamination of agar plates than a bacteriologic laboratory where, in spite of all care, a class of novices invariably spread germs from test-tubes and the air is usually heavily laden. And while the conclusions as to the relative merits of the various methods of cleaning up may be justly open to debate, the main object of the experiment, that of bringing to the notice of the students the several methods and imbuing them with the difficulties of surgical cleanliness, cannot be questioned, nor can the feasibility of the conduction of the experiment with reasonably large sections of students.

In Aid of Tuberculous Patients.—In the Massachusetts House of Representatives last week, the Committee on Cities reported a bill to authorize the city of Boston to hire not more than 100 beds in private hospitals and to pay not more than \$5 per week for the same, for the use of needy tuberculous patients. The bill, will be amended, so that the trustees of the tuberculosis hospital will be authorized to hire such beds, pending the erection of the proposed new tuberculosis hospital.

Pure Food Bill in House.—Representative Mann, of the House Committee of Interstate and Foreign Commerce, has reported the enacting clause of the Senate Pure Food bill, followed by the provisions of the Hepburn bill which passed the House during the last session. The bill attempts to give a measure of protection to the consumer by forbidding interstate traffic in falsely labeled or branded articles. The theory of the bill is that the consumer of food products is entitled to consume whatever he may wish, but that he is also entitled when he purchases an article purporting to be one thing, not to be cheated by having some inferior or different article passed off on him.

DIGEST OF MEDICAL LITERATURE

GENERAL SURGERY.

J. CHALMERS DA COSTA
JOHN H. JOPSON LAWRENCE HENDER
J. COLES BRICK JOHN W. CHURCHMAN

MOVABLE KIDNEY.

BY

PENN-GASKELL SKILLERN, JR., M.D.

But few conditions in the domain of modern surgery proffer such diverse opinions concerning etiology, semeiology, and treatment as does that of movable kidney. It will be my endeavor, impartially to present the views of certain observers as expressed in the newer literature, and, at times, to discuss them.

Most authorities concur that the gland ebbs and tides with respiration, but some contradict this. Those in favor have witnessed its motions at the operating-table, where they have measured the range, and detail its normal variations 2 cm. to 4 cm. (Harris, Trans. Amer. Surg. Assn., 1901, 457.) Our truest friend, anatomy, teaches us that the superoposterior surface of each kidney rests upon the diaphragm, just as it inserts posteriorly; therefore, is it hard to conceive that the contracting muscle tilts the kidney downward, just as a huge stone, levered along by a crowbar? So, too, the elevation of the inferior ribs would bulge the organ askance inward. These, by the way, are the exact directions the ptosing kidney heads for. We grant that the congenitally misplaced organ, fixed in or near the iliac fossa, stays its ground, mutely objecting to the motion. According to Kofmann (cited by Fischer, Centbl. f. d. Grenzgeb. d. Med. u. Chirg. Jena, 1898, Nos. 1-5) a mesonephron cannot be spoken of. Contrary to this, it has been seen and described by Priestly (cited by Morris, Med. Times and Gaz., 1857, Vol. i, p. 262), by Henderson (cited by Morris, Med. Times and Gaz., Vol. ii, p. 501) and Stevens (cited by Morris, Glasgow, M. J., October, 1883, p. 309). Some determine a floating kidney by a mesonephron (Betts, Toledo M. and S. Report, June, 1904, p. 402). Three degrees of nephroptosis are described (McWilliams, Med. News, New York, October 4, 1902, p. 625).

The pathology of this condition is a paradox; it may be most marked in that minor degree of displacement, and vice versa. Sturmdorf (Med. Rec., New York, January 13, 1906, p. 47) says: "Ectopic kidneys of early development will present the widest possible range of mobility, with the minimum of disturbance, while the more recently developed ectopia, with limited mobility, will announce its existence in unmistakable symptoms of local and general significance." The category of lesions advances from a sole chronic fibrous perinephritis, through congestion, degeneration, and atrophy, on one hand, and unilateral urinary obstruction, through hydronephrosis to pyonephrosis on the other hand, or both, respectively, as the vein, ureter, or both are implicated. It is thus possible to conceive complete urinary obstruction if a single kidney be present, either congenitally or after quondam unilateral nephrectomy, although the records are silent of this contingency. "There is

one pathological condition, however, which is due to the mobility, and which is not seldom met with by the surgeon when performing nephropexy. It is a certain degree of flabbiness and softness of the renal tissue, due to sacculation of the calyces from frequent moderate renal retention. These are cases of commencing or early hydronephrosis, which give no clinical sign of an enlargement" (Morris, Surg. Dis. Kid. and Uret., London, 1901, Vol. i).

The kidney may leave home alone, or accompanied by any or all the others of the abdominal family, the *tout ensemble* being distinguished by the title of "pan-splanchnoptosis," or Glénard's disease. The kidney may be the forerunner, may fall in with the others or tag on behind. General splanchnoptosis is not a common condition, and when present one need not heap the blame for the resultant symptoms upon the kidneys alone. Aaron (Journ. Mich. State Med. Soc., Jan., 1906, p. 86) says: "In the majority of instances when a movable kidney is found, it serves as an index that other organs of the abdominal cavity are displaced—cases in which the kidney alone is movable are those that give few or no symptoms."

The etiology is based on age, sex, and anatomic, physiologic, pathologic conditions, and traumatism. Any age: Commonly near the close of the third decade. Both sexes: In order of frequency, right side, both sides, left side in the female; right side, left side, both sides in the male. To anatomical causes is attributed the natural bent of the right kidney to get quit of its nest before its fellow, the huge flabby liver towering above its small but firm neighbor as the bag of a balloon lordly hovers over its subjacent basket. After reviewing the anatomical researches, Volkoff and Deletzine (Die Wanderniere, Berlin, 1899, cited by Halstead, Ill. M. J., Jan., 1900, p. 302) says: "From this it will appear that the principal factor in the causation of movable kidney, and also the explanation of its frequency in the female sex, are to be found in the variations from the normal configuration of the paravertebral fossas. The frequency of movable kidney in the right side is also explained by the shallowness of the right fossa as compared to the left."

That the kidney resents intrusion is shown by the dent it imparts to the liver, so that the latter bunks in the support offered by the tonic contraction of the abdominal muscles; when this prop collapses from overstrain, the liver starts for the center of the earth, accompanied by its fellows. The ascending colon is not so intimately connected with the right kidney as is the descending tube with the left, so the latter has this to its credit. Then we find the right kidney from 1 cm. to 2 cm. nearer the Promised Land. In this connection it would be interesting to observe the comparative frequency of right and left-side renal ectopy in right and left-hand individuals. Rapid wasting or a dearth of perirenal fat is put down by some as a predisposing factor, but Sturmdorf thinks that kidney support is not a question of fat supply and that the fatty capsule surrounds the kidney in a protective capacity and not as a support. If the fat be absorbed gradually, the kidney will be enabled the better to retain its equipoise.

Harris (loc. cit.) shares the view "that the essential cause of movable kidney lies in a particular body form, the chief characteristics of which are a marked contraction of the lower end of the middle zone of the body with a diminution in the capacity of this portion of the body cavity; that this diminution depresses the kidney so that the constricted outlet of the zone comes above the center of the organ, and all acts, such as coughing, straining, lifting, flexions of the body, etc., which tend to adduct the lower ribs, press on the upper pole of the kidney and crowd it still further downward. It is the long-continued repetition in a suitable body form of these influences which collectively may be called internal traumas that gradually produces a movable kidney." This may be likened unto that peculiar manner familiar to all of us that is inherent in some corks, spontaneously to pop their bottles. Sturmdorf (loc. cit.) maintains that: "Dislocated kidneys will invariably be found associated with characteristic skeletal stigmas—thus the possessor of a prolapsed kidney probably had club-foot or has acquired flat-foot, shows a tendency to or existing hernias, spinal curvatures, proneness to articular dislocations and fractures, uterine and ovarian displacements, and prolapse without apparent intrinsic cause."

The physiologic factor is associated with childbirth; anyone familiar with the powerful expulsive efforts concomitant with the second stage of labor, and the relaxation thereafter producing a resultant force similar to that experienced in pulling on a rope that, previously tight, has suddenly been cut asunder, can realize why such efforts, the more so if frequently repeated, are a very prolific source of wandering kidney. Over against this we see numerous nulliparas perturbed by mobile kidneys; the explanation of this is probably some such one as that mentioned above by Dr. Harris.

"There are, however, a series of other influences which demonstrate the dependence of movable kidney on the sexual department of a woman's organism; these are the numerous displacements of the generative organs, the descents, prolapses, and inversions of the vagina and uterus. Descent of the genital organs favors the descent of the kidney by direct traction, since they are directly connected with the kidneys by the peritoneum as well as by the ureter" (Landau).

Knapp (cited by Fischer, p. 83) alleges as causes of wandering kidney "preclimacteric and climacteric states of relaxation, since during and after the climax the elasticity and tone of all the organs and tissues undergo a considerable reduction. Vice versa, the menopause may favor the cure of a movable kidney through the accompanying deposit of fat."

Pathological causes of movable kidney include factors that bring about increase in the weight of the kidney, such as sarcoma, carcinoma, hydronephrosis, a large calculus or aneurysm of the renal artery, especially if associated with a false renal hematoma, causing an unusual tugging at the not overly strong fibrous support of the kidney. This is the so-called spontaneous dislocation. As soon as an adhesive perinephritis sets in, however, further excursion of the organ is curtailed. Observed after celioparacentesis for extensive ascites, or after the ablation of a large intraabdominal tumor, we

attribute the ensuing kidney-drop to the removal of the support afforded it by the tonic contraction of the abdominal wall.

Litten (cited by Osler) holds that "dilation of the stomach is the cause of the mobility of the kidney, and he found in 40 cases of depression and dilation of the stomach 22 instances of dislocation of the kidney on the right side."

Chandler (New York Med. Journ., 1905, lxxxii, p. 576) reports a case of floating kidney due to colon displacement.

Traumatism is generally considered when treating of the etiology, albeit Harris (loc. cit.) avers "a distinctly movable kidney is never the immediate result of a single injury or external trauma." Landau, (trans. by Champneys, New Syden. Soc., 1884, p. 336), says: "The occurrence of this *luxatio traumatica renis* is established by trustworthy observations." Together with such direct or indirect violence, it would not be amiss to consider the effect of tight lacing; this seldom shares in the etiology nowadays, since the obsolete flask-shape stays, which constricted the waist and allowed the abdomen to jut out, have been replaced by the straight-front stays, which, correctly put on, furnish excellent support to the abdomen."

An unusual cause is mentioned by Stifler, cited by Fisher, p. 143 who attributes to masturbation 5 of his 100 cases of movable kidney, and of these 5, in 2 there was bilateral dislocation.

The symptoms ascribed to a dislocated kidney running riot in the abdomen are expressive of *diablerie*, the torments of which far surpass those depicted by the brush of Hogarth. Thus, Suckling ("Ren Mobilis," London, Oct., 1905), in a unique booklet, forbodes these dire possibilities for a sufferer from *ren mobilis*: Incontinence of urine in daytime. Sexual troubles, in women; sexual delusions, in men, seminal emissions. Pain and acute mania at menses. Mental symptoms, mental depression, hypochondriasis, melancholia, mania, insanity, suicide from mental depression. Loss of memory, energy, absolute loss of power of walking, and 21 others. No wonder that Osler (Prin. and Pract. of Med., 5th. ed., 1905, though he chloroform his own, yet sympathizes with the gentler sex enough to say: "It is well never to tell a patient that a kidney is movable; the symptoms may date from a knowledge of the existence of the condition." In antithesis to the pessimism of Suckling, Osler states: "In a large majority of cases there are no symptoms." So there is movable kidney and movable kidney.

Gallant (N. Y. M. J., April 29, 1905, p. 833), says that the symptoms due to prolapsed kidney are characterized by (1) their acuteness; (2) frequent recurrence; and (3) rapid subsidence after the kidney has been replaced. But, as we shall see, this is not true in every case.

There are subjective and objective symptoms. The average patient complains of a sense of discomfort and dragging in the loin or loins affected; a feeling as though "something were loose." Her pains, usually in the lumbar region, delineating the distribution of the lumbosacral plexus of nerves, may be very widespread in any part of the abdomen or more distant parts of the body,

especially between the ribs and in the head. These pains are usually confined to the same side.

"The variability of the pain referred here, there, and yonder, is understood when we recall the rich network of sympathetic ganglia and nerves in relation to the kidneys and suprarenal capsules" (Deaver, Annals of Surg., Philadelphia, 1899, xxix, p. 700).

"Menstruation produces increase of the pain and impairment of the general comfort. This pain can almost constantly be found in women with movable kidney at the menstrual period, even when they are free from it betweenwhiles. Whether it is induced more by menstruation or by the movable kidney cannot now be decided. The fact, however, that it sometimes quite ceases after menstruation and after the menopause, proves the existence of a vasomotor connection between the generative organs and the kidney, that is, between the ovarian and renal plexuses" (Landau, loc. cit., p. 255).

"Some women feel beating, or a more circumscribed gnawing, griping pain in the region of the navel. These unpleasant sensations are compared, by women who have had children, to fetal movements, and they sometimes think themselves pregnant, especially if they wish to be so" (Landau, loc. cit., p. 283).

The acme of pain in this condition is reached when the crisis, as originally described by Dietl in 1864, occurs.

"Violent pains, unspeakable distress, restlessness, oppression, nausea, vomiting, syncope, and not infrequently obstruction of urine and circumscribed peritonitis are the symptoms of a deeply prolapsed and incarcerated kidney" (Dietl, Wien. med. Woch., September 17, 1864, No. 38, p. 594).

In addition to the sudden, severe abdominal pain, these paroxysmal attacks are manifested by chills, fever or subnormal temperature, if collapse supervene, cold sweats, and rigidity, distention and tenderness near the incarcerated kidney that is the cause of this tempest-in-a-teapot. Why these crises come to pass is explained by complete rotation of the kidney on its long axis, twisting the renal vein, artery, and nerves of the pedicle, and compressing or kinking the ureter, the possible consequences of which are set forth above under the pathology. Dietl's phenomenon, together with the objective findings, comprises the most distinctive symptom of dropped kidney. Like in pneumonia, the patient enjoys more comfort by lying on the side affected: should she arise and exert herself, the pain may become aggravated.

Added mischief of which the kidney is capable involves, more or less seriously, the gastrointestinal tract or pelvic organs. The woe of the stomach may be expressed by mere distress, slight indigestion, dyspepsia, with its palpitation of the heart, dizziness and heartburn, or nausea, vomiting, dilation, and even gastric ulcer, as in a case reported by Bramwell, cited by Suckling. The milder gastric symptoms are usually explainable by discord in the great semilunar ganglia, created by the renal plexus by reason of its "intimate associations with the solar and aortic plexuses, outer part of the semilunar ganglion, and lesser and smallest splanchnic nerves. The nerves from these sources, 15 to 20 in

number, have numerous ganglia developed upon them. They accompany the branches of the renal artery into the kidney" (Gray, New Amer. Ed., reedited by Da Costa, 1905, p. 1084).

The severer gastric symptoms are accounted for by Morris (Surg. Dis. Kid. and Uret., Vol. i, p. 112): "Folds of peritoneum have been observed passing from the kidney to the duodenum in such a way that when they are pulled upon, the lumen of the duodenum is narrowed or even occluded, as in a case recorded by Franks." This suffices to explain the fleeting attacks of biliary obstruction. In other cases (Landau, "Mov. Kid. in Women," p. 529, New Syd. Soc., 1884) the jaundice is part and parcel of the gastrointestinal catarrh, referred to again. Brown, cited by Sinkler (Jour. Amer. Med. Asso., Feb. 13, 1904) reported two cases of glycosuria he believes were due to dragging on the pancreas by the kidney; no glucose was present in either case after nephropexy was performed. The mucous colitis so often seen is attributed by Beyea (*American Medicine*, Phila., 1901, Vol. ii, p. 441) to reflexes to the plexuses of Auerbach and Meissner; by others to dragging of the kidney upon the colon. Associated with this catarrhal condition we find, at times, the slight jaundice mentioned above (Morris, loc. cit.). Appendicitis in connection with movable right kidney is referred to by Edebohls (Amer. Jour. Obstet., N. Y., 1895, Vol. xxxi, p. 161), who is misquoted by Sinkler (loc. cit.) thus: "Edebohls believes that movable or displaced right kidney is directly responsible for almost every case of appendicitis." In his article Edebohls says: "As the result of our investigations, we found that over 60% of patients with movable right kidney producing symptoms were at the same time possessors of more or less diseased appendices vermiformes. The writer believes that the movable right kidney is directly responsible for the appendicitis in the vast majority of these cases of coexistence of the two affections. The movable right kidney dislocates the duodenum and head of the pancreas, compressing the superior mesenteric vessels between the head of the pancreas and bodies of the spinal vertebrae." Concerning the gynecological importance of prolapsed kidney, Goelet (Med. Rec., N. Y., Oct. 22, 1904, p. 641) says: "Prolapse of the kidney may have a strong influence in causing or maintaining such conditions as persistent leukorrhea, endometritis, uterine hemorrhage, uterine displacements, even ovaritis and salpingitis, and hemorrhages into the pelvis (hematoma and hematocele), irritable bladder, and even cystitis. The return circulation from the pelvis through the ovarian vein may be interfered with by the lower pole of the kidney swinging inward toward the spine, overlapping the vein, or the vein is in front, and the ureter behind it where they cross. Therefore, when the kidney descends, the ureter becomes bent upon and drags on the vein."

Venous obstruction with edema of the leg from pressure of the kidney on the inferior vena cava; an instance of this has been observed by Landau (trans. by Champneys, New Syden. Soc., 1884, p. 336), but the edema began to disappear as a pregnancy, which had supervened, advanced. This pressure may also encourage the formation of a thrombus in the vein.

Of the symptoms directly concerning the urinary tract, the chief is hydronephrosis, intermittent as long as the kidney can recover itself by posture, otherwise permanent from the formation of a stricture in the ureter where it has become kinked; atrophy of the kidney may result, or, infection added, pyonephrosis. Pain originating in the kidney and radiating down the ureter into the bladder, and irritable bladder have been described.

"The most common symptoms associated with movable kidney are disorders of the nervous system, such as hysteria, neurasthenia, and mental depression. Of these, probably the most constant is neurasthenia. There are in some cases attacks of severe epigastric pain with retching, like the gastric crises of tabes, and often there is gastric pain, which comes with regularity one or two hours after eating and large quantities of gas are belched up, simulating gastric ulcer. The patient sleeps badly and the sleep is broken and disturbed by dreams. Patients with movable kidneys are also extremely nervous and irritable and are often in a condition which makes them not only uncomfortable to themselves, but a burden to their friends. There are various reflex hysterical disturbances. Hypochondriasis and mild mental disturbances, like melancholia, are sometimes associated, but these conditions occur only in cases of long standing. These nervous phenomena rarely occur in men, but when they are met with in that sex they are very intense" (Sinkler, "The Nervous Phenomena Associated with Movable Kidney," loc. cit.).

To these may be added a rather unusual symptom mentioned by Hirst (cited by Gelder, Internat. Med. Journ., St. Louis, June, 1905, p. 462): "The patient finds herself instinctively raising the right shoulder or habitually keeping it higher than the left if the right kidney alone is displaced."

The fibrous investment of the kidney does not include the suprarenal gland, so that when the kidney forsakes its nest, it emigrates bareheaded, as it were. That congeries of symptoms, reflex in character, Lucas-Championnière (Rev. gén. de clin. et de therap., Paris, 1904, Vol. xviii, p. 21) would attribute to irritation of the plexus of the suprarenal gland by traction of the ptosed kidney. Paralogy in this deduction is *prima facie* self-evident, for it is not in accord with the clinical picture of a widely aberrant kidney that creates no disturbance. But does this not obtain likewise for the theory of reflex irritation via the renal plexus? On the face of it, yes. The advocates of this postulate may make themselves seen and heard only when such symptoms are present. To "irritate" these sympathetic nerves, it would seem that the renal artery or its branches must needs be stretched or twisted, for the delicate nerve filaments are supported by the stronger arteries.

Instead of detailing such ominous (and rare) extreme nervous symptoms, as Suckling has, it were simpler to say: Neurasthenia may coexist with movable kidney and may be mild, moderate, or advanced in degree, for the proper conception of neurasthenia includes comprehension of its various phases and possible ultimate transitions, as defined by Dercum (Proc. Phila. County Med. Soc., Nov. 29, 1905, p. 371). But what is the tangible

fount and origin of this neurasthenia that so often vanishes after permanent restitution of the kidney to a good position? Now we are in troubled waters. Most think it is the peripheral sensory irritability, in which the kidney itself is the agent, that, in turn, brings about "fatigue of the cortex, producing diminished cerebral inhibition, resulting in liberation of the spinal neurons, which thus overact and are overirritable" (Pickett, *Proc. Phila. County Med. Soc.*, Nov. 29, 1905, p. 309). But individual ego self and constitutional stamen must be considered, especially when the patient discovers the tumor. In the presence of mucous colic that so often accompanies movable kidney, especially if associated with Glénard's disease, Kemp (*Med. News*, N. Y., July 8, 1905, p. 57) would infer that the neurasthenic condition is probably the result of autoinfection.

Urinary symptoms of movable kidney for the most part depend upon the integrity of the renal bloodvessels and ureter. Küttner speaks of frequent straining in order to urinate, and of slight polyuria. Alterations in the quantity and quality of the urine are common. It may be scanty, or may be excessive, producing marked polyuria. The former is due to obstruction of the flow by kinking of the ureter, the latter to spontaneous relief of hydronephrosis with consequent relief of glomerular pressure. Qualitative alterations include high-colored urine that deposits a copious sediment of uric acid, oxalates, blood, pus. Such urine is seen during an attack of Dietl's (loc. cit.) crisis. Hematuria is due to venous engorgement, or injury to a movable kidney. Pus is indicative of pyonephrosis. Orthostatic cyclic albuminuria, or albuminuria of adolescence in relation to movable kidney is discussed by Sutherland (*Amer. Jour. Med. Sci.*, Aug., 1903, p. 289). In 40 cases of orthostatic albuminuria, he has met with movable kidney in 15 patients with a lowered vascular tone, due, he thinks, to probable venous congestion of the kidneys, with altered nutrition and glomerules. Displacement of the kidney aids the process, and the cessation of albuminuria in the reclining posture is best explained by the restoration of the kidney to normal position in this attitude. That such changes in the kidney may lead to nephritis is proved by Edebohls ("Surg. Treat. Bright's Disease," N. Y., 1904, p. 2) in a case that led him to suggest renal decapsulation for nephritis.

Of the objective symptoms revealed by physical examination, by far the most important, reliable, and positive is obtained by palpation. "Lying in wait, capture, and escape" graphically describes the situation (Glénard, cited by Treves, *Practitioner*, London, Jan., 1905, p. 9). The sensation imparted "simulates a piece of wet soap" (Bradford, *Pract. of Med.*, Gibson, London, 1901, Vol. ii, p. 307). The renal outline of the tumor, and sickening sensation similar to that imparted by pressing upon a healthy testicle or ovary, but of less degree, are characteristic. In rare cases the pulsation of the renal artery may be felt.

The other objective symptoms are, as usual, elicited by inspection, percussion, and auscultation. Suckling (loc. cit.) believes there is a "facies" peculiar to nephroptosis, for he exhibits a photograph of a man "exhibiting the typical appearance of one suffering from

movable kidney." Osler (*Montreal M. J.*, Vol. xvii, No. 5, November, 1888, p. 486) in examining a case of floating kidney in the erect posture, observed "a marked difference existed in the appearance of the renal regions behind, particularly apparent in looking over the patient's shoulders. There was a distinctly deeper depression on the right side corresponding to the eleventh and twelfth ribs." Landau (loc. cit.) says that this depression, especially plain in the knee-elbow position, is an untrustworthy and exceptional sign, and that in certain positions, especially when the legs are adducted, the so-called lateral lumbar sulcus corresponding to the lateral border of the sacrospinalis (the erector spinæ of Gray, loc. cit.) muscle, normally comes out pretty plainly in thin subjects. In the latter, in the erect posture, the kidney may at times be seen bulging out the anterior abdominal wall, and pulsations of the abdominal aorta may be seen in decubitus. Palpation may give no result, for the movable kidney is shy at times, and not so bold as its floating kin, which ordinarily may be felt the first thing. Treves (loc. cit.) advises that the kidney be coaxed by three or four examinations at as many sittings. Deaver (loc. cit.) describes how to place the hands on guard, in ambush. Enlargement of other organs may materially interfere with this method of detection. On percussion, the kidney may seem to be intraperitoneal or extraperitoneal; floating kidney is intraperitoneal. In Osler's case, percussion gave flat tympany over the right renal region when the patient was on the left side or when the kidney was voluntarily dislocated by a deep inspiration. Such findings should be compared to those of the opposite side, unless both organs be dislocated. The actual value of the tympany obtained by percussion, and of the depression seen by inspection, is that they disappear on restoring the kidney to its nest. Auscultation, in rare cases, may reveal a bruit, heard over the infracostal fossa, if the renal artery be twisted. Trousseau (*Clin. Med.*, Phila., 1873, Vol. ii, p. 934) verifies the renal identity of the tumor by the similarity of the pain obtained by pressure over it to that of the opposite renal region. Röntgen photography as a means of diagnosis Rosenthal (cited by Fischer, loc. cit., p. 23) considered proper to give information in doubtful cases, and Kümmel (cited by Fischer, loc. cit., p. 23) states that the shadows of the kidney are to be seen now and then by intimation.

Generally speaking, the recognition of a movable kidney is not beset by considerable difficulties. The conditions from which it must be identified are: "Phantom abdominal tumor, partial contractions of belly muscles, aortic aneurysms, displaced spleen, enlargement of the gallbladder, a growth of the pylorus, of the head of the pancreas, ascending and descending colon; mesenteric or omental growths, an elongated lobule, circumscribed abscess or echinococcus cyst of the liver, an ovarian tumor with a long pedicle, a pedunculated uterine fibroid, intrauterine and extrauterine pregnancy, appendicitis, and nephritic colic" (Deaver, loc. cit., p. 708). How to reach a correct conclusion is most admirably explained by Dr. Deaver.

Diabetes and Surgery.—Since asepsis has been in-

roduced into surgery, wounds and operations on diabetics do not necessarily mean fatalities any more, but diabetics are much more likely to contract wound infection than nondiabetics, and in addition they are exposed to one other danger, namely, coma. Karewski (Berliner klinische Wochenschrift, 1905, xlii, 253, 295, and 330) maintains that no special symptoms characterize operations in diabetes, and that no matter what occurs, the same could take place without the injury which the patient has received or is receiving. An infection is the more likely, however, the higher the percentage of sugar in the urine, and the more resistant the sugar is against appropriate diet. The better the asepsis the less likely the infection, but this may develop in even the cleanest cases because of the presence of sugar in the tissues, and therefore no patient should ever be operated on without first, if at all possible, subjecting him to a course of antidiabetic treatment. Another point of importance is the general health of the patient, and a patient with a large amount of sugar in good general health is better protected against infection than another with less sugar but being in poor health. But inasmuch as patients even in the best of health and with only small amounts of sugar may develop bad symptoms, it is the duty of every physician not to order an operation unless he can be tolerably sure of the outcome; coma has occurred when no sugar has existed for years; it occurs in cases with large and small amounts of sugar after slight and grave operations. Before every operation the urine should be carefully examined for sugar, so as to discover even small traces, even though the typical dyspneic type of coma is usually connected with the appearance of aciduria and acetonuria. The occurrence of this has by some been blamed on the use of chloroform as a general anesthetic, but they and coma have been reported where only local anesthesia has been employed; others blame it on the exclusive meat diet in the antidiabetic preparation, as it always increases acid in the blood, even though it diminishes sugar in the urine; still others blame the starvation before the operation, also the free purgation of the gastrointestinal tract; others the starvation after the operation. The loss of the accustomed bodily exercise and the mental excitement associated with such operations is also to be considered in the production of such coma, but it is most likely that a number of these conditions combined are responsible for it. Coma has also set in in cases without acid intoxication and with but a small amount of sugar, and this has been noticed especially in cases where the peritoneal and thoracic cavities were opened, even though neither the peritoneum nor the pleura are more vulnerable in the diabetic than the nondiabetic. All these points show clearly that in no operative interference should the prognosis be more carefully given than where the patient has diabetes. To prevent these possible dangers no superfluous operation should be performed on diabetics; if possible, antidiabetic treatment should precede the operation for some time; meat and fat cures should not be resorted to; if the blood is loaded with acid, operations should only be performed if they are necessary to save life; large quantities of alkalies should be given the patient before and after the operation; the starvation and intestinal preparation for the operation should be reduced to a minimum; the operation should be performed early in the morning, so the patient need not hunger longer than necessary. Where local anesthesia can be employed, it should be, but the tissues must not be overdilated; Schleich's method is, therefore, not applicable. The operative procedure should be as simple as possible, as the simpler, the better the chances for healing quickly and the smaller the chances for coma. In determining whether operations should or should not be performed, it must always be considered whether or not the waiting increases the dangers of the condition. While conservative measures must always be employed

in cases where such measures are of no value or even a decided danger, the operation should be performed at once; example, ordinary and profusely bleeding hemorrhoids, ordinary and incarcerated hernia. In intestinal cases, the longer operation is put off the less the chances for recovery; appendicitis cases must be operated early. In malignant cases the risk is small, the chances of helping the patient considerable; the results in rectal carcinoma are the poorest; the establishment of an artificial anus is preferable to excision; other gastrointestinal carcinomas can be operated on aseptically. Furuncles, carbuncles, and all other suppurative conditions must be excised; coma often follows simple incision; if the patients are sufficiently strong, existing coma is no contraindication. The simple inflammations should be treated without operation whenever possible; this refers especially to inflamed corns and ingrowing toenails. Joint and tendon suppurations require large openings to further the purulent discharge. When amputations are considered, each case should be a law unto itself; no amputation should be performed unless good blood supply and perfect asepsis can be guaranteed; all complicated methods are to be thrown aside for simple ones. [E.L.]

Multiple Abscesses of the Kidney from Acute Ascending Infection.—H. L. Barnard (The Lancet, October 28, 1905) reports six cases in which *Bacillus coli communis* caused a rapidly ascending infection of the urinary tract, resulting finally in abscesses of the kidney. The condition usually occurs in women and starts with symptoms of a severe acute urethritis. On the second or third day the involvement of the pelvis and the kidney is indicated by pain and rigidity in the upper part of the abdomen and loin by rigors and vomiting, increased pyrexia, and the appearance in the urine of epithelium and casts from the kidney with abundant albumin. The symptoms of urethritis and cystitis then abate, but the patient becomes profoundly prostrated. A tumor appears in the region of the affected kidney. When only one kidney is involved, the best treatment is to expose it through the loin and remove it, this being followed by immediate and complete cure in four of the six cases narrated. In slight cases the more conservative measures of splitting, partial resection, and drainage may be practised. The kidneys are ordinarily protected from bacterial invasion from below by (1) the small lumen of the urinary passages, which secures an efficient scour by the passing urine; (2) the complete emptying at frequent intervals of the putrescible urine from the cavities and tubes; (3) an intermittent flushing from above by sterile fluid. All of these means are circumvented by an obstruction which dilates the urinary passages and cavities. The gonococcus is the commonest example of an organism invading a normal urinary tract, but its infection seldom passes beyond the bladder. These cases here reported show that *Bacillus coli communis* is another organism capable of ascending the normal tract in spite of all safeguards. [B.K.]

The Etiology of Noma.—C. Herrman (Archives of Pediatrics, November, 1905) believes the micro-organism which plays the most prominent part in the etiology of noma corresponds to the streptothrix of Seiffert-Perthes, and should be called the spirochaeta of necrosis. It is identical with the organism found by Plaut, Bernheim, Vincent, and others in ulceromembranous lesions of the mouth and also with *Spirillum putigenum* and *Spirochaeta dentium* of Miller, found normally in small numbers in the mouth. The organism is probably present in the atmosphere in the form of very resistant spores, and may be introduced into the body with food and water. In order that a gangrenous process should result, there must be a preceding change in the tissue. Ulcerative and gangrenous stomatitis represent different stages of the same process. The presence of diseased teeth undoubtedly plays an important part in the etiology of these forms of stomatitis; hence in the

infectious diseases of childhood particular attention should be given to the teeth. The most rational treatment of noma is the application of the Paquelin cautery. [A.G.E.]

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Precocious senility, when marked and rapid, is so rare as to be of mere academic interest, a pathologic curiosity, such as the recorded instances of children of 6 years dying with arteriosclerosis and other signs of extreme age. Even the cases which last 30 to 35 years are very uncommon, but a much larger number of milder cases have so long been noted as to have given rise to the axiom that a man is as old as his arteries. These cases deserve more thought than is given to them, not so much to discover cures as to prevent decay, and save to society so many valuable lives which are now snuffed out in the middle age by diseases of the senile. There has been much wild speculation on the subject, chiefly in lay journals, and due, no doubt, to some more or less sensational investigations of Metchnikoff on the causes of normal senility and the possibility of prolonging human life beyond the century mark. Yet it is a serious problem, and we should know what is the stimulus which makes one organism go through all its life changes in 50 years, while another under apparently identical conditions lasts 30 years longer.

Mental precocity has no known relation to precocious senility. Many men of genius who lived to a considerable age, have been noted for precocity in childhood, while on the other hand, it is often if not generally a fact, that the precocious youth is doomed to early death. They are the unstables who have no normal checks to development and who are exhausted in a few decades. Yet quite a number are instances of the rapid course of life, which develops early and declines early. They are abnormal—so abnormal that there must be a cause for it. It is certainly to be found in antenatal life or still further back. Perhaps it can be found in the grandparents. There is then a great field for investigation rich beyond measure, but practically untilled and ready for the workers. The whole matter of precocity of every sort, and longevity too, may yet be explained to the vast benefit of mankind.

An age limit for retirements from active life is an uncertain, unjust, and expensive matter—even a dangerous matter. Military men, for instance, are sometimes too old at 55, both mentally and physically, while now and then one is found who is entirely too young at 62 or 64 for the nation to lose his services. Congress is aware of the problem and has long debated it, trying to find a way of determining senility, so as to relieve all the government services of faithful servants who do not appreciate their age—and it is said that no man ever really believes he is aging until he can scarcely totter. Many propositions have been made, but they are generally rejected through the fear that good men will be forced out through personal enmities and inferior ones retained through personal, military or political favoritism, the three great dangers in all armies and navies. At the present time Congress is being requested to devise a scheme whereby more youthful officers can be obtained for the higher positions in the army, through the elimination of the least efficient and the more rapid promotion or selection of brainy men who generally eat their hearts out in subordinate stations longing throughout life for opportunities to work. So far as reported in the press, the question of premature senility has not been mentioned, but it should be, for it is the real cause of much inefficiency. In civil life the victim is merely thrust aside by the course of events, in military life he blocks them. The German Emperor dealt with the matter in a rough way some years ago, but it was effective. The British navy is ruthless in retiring men who do not gain promotion soon enough, and the Japanese are imitating them. We will be required to follow, too, for our army and navy are to have active work for all time by present indications. The problem is very complicated, for if favoritism is to be the plan adopted, one kind is as bad as another—indeed, military influence is the worst, for it favors the sycophant at the expense of the independent thinkers who are an insufferable nuisance to the martinet and the senile.

The Ethics of Proprietaries Advertising Through Hospitals.—In our correspondence department of the current issue appears a communication from a physician subscriber describing the details of a plan for exploiting a proprietary preparation through the hospitals. Assuming that this preparation is one of known composition and proved value, it is desirable—indeed necessary—that there be means of bringing it to the attention of all physicians. The proposed method is so clearly wrong that it deserves a word of comment. The test to apply to all ethical questions of this sort is quite simple. The sole consideration is the welfare of the sick, and their interests demand that the physician shall be unbiased. If he knows that the hospitals and dispensaries in which he is interested will be benefited if he prescribes a certain thing, he becomes an unconscious agent for its sale. He will surely prescribe it in cases for which it might otherwise be omitted, the benefit of a doubt being thrown to the side of the drug. The welfare of the patient is sacrificed for the welfare of the hospital—not purposely, of course, for that would be inhuman and impossible, but unconsciously. It is called *bias*, in the laws of evidence, which by the way are based upon a more exquisite practical knowledge of psychology than is generally believed. A witness destroys or at least taints his own testimony if it is shown that he is in any way benefited by it. The physician's idea of a value of a drug is therefore tainted if he is benefited by its sale, even remotely. A justice of our Supreme Court does not dare to sit in a case in which he is interested in the slightest degree. The same high standard is necessary for a physician and in one sense of the word it is more necessary, for he is dealing with human life, while the judge is concerned generally with a few dollars' worth of property. The sociologic side of the question also deserves a word. A large sum of money is to be deliberately taken from the workers and devoted to the failures. Our sympathy for the beneficiaries of hospitals and dispensaries should not blind us to the fact that as a rule they are not so worthy of help as the industrious. The Lord helps them who help themselves, but he does not leave all the rest for us to worry about—at least not to the extent of injuring others. This new scheme will pay—of course it will; any means of playing upon unconscious prejudice will pay—temporarily. In the end it will be distinctly harmful and we hope it will not be tried. We naturally resent the huge quantities of literature and samples dumped into our offices and the preempting of our time by plausible sample flends, but they are the less of the evils after all.

The bedbug (*Cimex lectularius*) has at last come under suspicion as a disease carrier. Experimental

tuberculosis has been produced by injecting into susceptible animals the crushed bodies of insects taken from a bed occupied by a consumptive, but whether they could infect by simply biting is open to doubt. That skin infections could be thus carried is a reasonable conclusion, particularly as skin diseases are quite common in people who are not concerned over the presence of these vermin. It is said that some attention has been given the matter in Italy, but no details are available, as there is but little literature on the subject in English. Some kinds of bacteria have been fed to bedbugs to test whether they could be recovered from the feces. Hankin, for instance, is said to have shown that plague bacilli are destroyed in the alimentary canal. The importance of the matter is in the fact that it might be possible to explain thus certain diseases contracted by travelers. There are so few infections that can be honestly blamed upon the insect that it is of minor importance here, but it can be well imagined that in the tropics among the unclean natives leprosy might be thus transmitted; so the subject is of considerable importance and deserves more investigation. It is claimed that the pests are much more prevalent in good houses and hotels than one is willing to admit, but we hope that it is a false alarm.

The Japanese military medical methods, as described by the son of one of the medical officers of the Japanese navy, are of such interest that we quote his remarks more fully in another column (page 417). Briefly, it might be said that the army has used the skill of the sanitary experts instead of ignoring them. They are said to place all the work of prevention of disease in the hands of those who know the most about it. We are accused of placing it in the hands of those who know the least. They make the sanitarians responsible, but we make the line officer responsible, and if he fails we do not punish him, because he is not supposed to know better. Our system is to keep the sanitary expert in the rear, merely to treat the sick sent back; they are said to keep him in the very front to guard against sickness. The orientals always did do things upside down, yet we must sorrowfully confess that we seem to be the ones who are upside down this time, for it is said that while occidental armies generally lose more by illness than by bullets, the Japanese have reversed the figures. One dispatch states that while 57,150 men were killed or died of wounds, only 15,300 died of disease. If all this is true, and it has the earmarks of reliability, it is the first definite information of the war so far received upon which we can base safe conclusions for our own benefit. It is quite evident that our army system must be overhauled in the interests of sanitary effi-

ency. The actual hygienic measures used by the Japanese are said by Surgeon-General Suzuki, of the navy, to have been very simple things we have known for nearly a generation—they merely applied their knowledge. They have proved themselves experts in doing, but from the time of Dickens, and long before that, Anglo Saxons have been accused of being experts in knowing how not to do.

Military Sanitarians Must Be Made Responsible for the Health of the Army.—Last year a prize was given to an essay which advocated continuance of the old system, but also suggested teaching the line officers enough sanitation for the purpose, forgetful of the fact that such a course is impossible.¹ The Japanese line officer doesn't know this science, and doesn't care to know, as he has enough to learn about guns and bullets, so what the doctor says goes with him. Not so with us. We tried the old system on the canal zone, too, but it did not work any more than it did at Camp Alger. Yet it is humiliating to have a Japanese tell us that when anything is wrong with their foods the doctors are sent to rectify it, while we once sent an Amiral. About two years ago, a cavalry officer and an artilleryman were sent from Manila to India to investigate diseases, horse and human, while the experts remained behind. This would be incredible anywhere else. Surely something is wrong and something must be done to rectify it. The English are puzzling over the same problem in their army, yet even they sent medical experts to Africa when disease was to be investigated. We earnestly commend the matter to Congress to find out the defect and rectify it. It is improper to criticise until we do know the fault. We are comparing results. Yet we must protest against calling the medical department "a humiliating failure," as stated by one speaker at the recent meeting of the Association of Military Surgeons. Our army surgeons have accomplished great things when they had the chance. Their work in advancing medical science also shows that they are capable of doing more than the Japs and not less. Perhaps we are making a misake in subordinating the surgeons to the line officer too completely—the system abandoned by the Japs and abandoned at Panama; the system harking back to the time when the surgeons were barbers and not educated scientists. More medical independence and authority seem to have solidified the Jap army, instead of disintegrating, it as our officers felt would be the result. We civilians would like to know what is wrong, and hope that Congress will find out and listen to any suggestions the Surgeon-General may make to increase the efficiency of the medical department.

Military sanitation has been recently advanced by a War Department order, which seems to be of such importance as to warrant the prediction that it is the beginning of an epoch wherein the sanitarians will be able to imitate and improve on the results of the Japanese war. It seems that though it has long been the legal duty of military surgeons to give professional care to the families of officers and soldiers, it has always been interpreted that he shall not do so unless he is asked. This curious system has led to the abuse of calling into military reservations unqualified or dishonest physicians who have concealed contagious diseases and endangered the health of the soldiers. This is now checked, by making it the immediate duty of the officer or soldier, who wishes to send for a civilian practitioner, to notify the commander of the fort, who notifies the surgeon, who in turn investigates, and if the disease is liable to spread, he is to take charge of the case and of all preventive measures. The revolutionary step taken is in that part of the order which makes the sanitarian responsible for the measures to prevent the spread of the disease, and not the layman in command, as formerly. The War Department should receive the thanks of the nation for this important bit of common sense. It is directed that civilians who violate the order shall be removed from military reservations, and it is presumed, of course, that officers and soldiers who interfere with the responsible sanitary officers will also be summarily dealt with. One naturally thinks that a different history would have been enacted if such a policy had been in existence in 1898. It is to be hoped that this morsel of comfort will be made a whole loaf, and that the sanitarians will be made responsible in all such preventive measures, whether there is an actual case of disease present or not. We trust that in the future anyone who tells a sanitarian to mind his own business and keep his suggestions until called for, will be invited to retire to civil life, where he cannot harm our army. Perhaps if an example is made of one or two, the rest might see a great light, and learn that the people are still very sore over the results of the Spanish war, particularly those who have lost relatives by preventable diseases. When they find out who was at fault, they may not be very merciful.

The place of play in school work was ably discussed by Professor Tyler¹ in a lecture before the Boston Twentieth Century Club. The matter is of such great hygienic importance as well as educational that it is desirable to have his lecture printed and placed in the hands of every teacher. There are many books on this subject, notably those by Professor Karl Groos, of the

¹Journal Military Service Institution, January, 1906.

¹ Boston Evening Transcript, December 16.

University of Basel, treating of the play of animals and man in a philosophic and scientific manner, but there is great need of something shorter for the busy people. It is necessary to popularize what is now proved as to the vital necessity of much play with frequent periods of rest for training all the faculties and developing self-reliance. In all the higher animals play is the essential part if not the whole of its education, and the same may be said of young children. It must be used and systematized not only in the kindergarten, but in all the higher grades with diminishing importance educationally as maturity is reached. It is a moral force, too, for none are so quick to detect and resent unfairness as mere babes at play. To crush the play instinct is to ruin the child. Tyler states that children who can attend but half time daily make greater progress than full-timers. Even the poor children who work half time make better progress than those who have all school and little play. We are at last getting back to nature in this matter and we can see the dawn of a better day for the babies. Japan is called the child's paradise, because they have brought the matter of play to an exact science for centuries; it's a fine art there and the schools are models of natural methods. We ought to catch up with the Oriental Yankees.

Preventable diseases in war should receive more comment in the lay press than they do. Major Goodwin, of the Royal Army Medical Corps, in a recent paper read before the Royal United Service Institution, stated that in the South African war they had 18,000 admitted to sick report for wounds and 400,000 for disease! This is in an army in which the surgeon's main duty is to cure and not to prevent. The latest statistics from the Japanese, who had in the field in Manchuria over twice as many soldiers as the English had in Africa, show that there were about 150,000 wounded and about the same number of admissions for disease, perhaps a few more. This is in an army where the surgeon's main duty is to prevent disease. If the poor benighted Japanese had adopted the methods of English and American armies they would have had 3,000,000 sick—that is, they would not have been able to whip the Russians at all. It is now known that the Japanese surgeons are individually no better, if as good, as the English, and that the wonderful results are due to their system. It is high time that we introduce the same system, unless it is desired to continue the plan of producing pensioners. A Japanese soldier has one chance in four of being hit and 33 chances in 100 of being neither sick nor wounded; an English soldier has one chance in about 20 of being hurt and will be sick several times. The chance for getting a pension will be so greatly reduced by changing

our system that it is quite likely there will be considerable opposition to any such Japanese innovations. As far as known, absolutely nothing has been done to prevent a repetition of our own Spanish war camp scandals if we go to war again.

The ethics of therapeutic falsehood has occupied considerable space in the lay press recently as a result of the discussion aroused by the moral views of Mr. John D. Rockefeller, Jr., as expressed to his Sunday-school class in a lecture on lying. He is of the firm belief that there can be no necessity for a lie in any circumstances. If the physician by a false statement can quiet alarm and thus cure a patient, or prevent others becoming ill, he must tell the truth none the less, no matter what fatalities result. It is better to sacrifice lives than to shake the patient's confidence in our veracity. We are very much afraid that the greatest harm would come from shaking the patient's confidence in our humanity. Only children and millionaires can afford to tell the truth—the doctor's business is to cure and not to kill, as he surely would if he was always candid. Happily for his peace of mind, it is only very rarely that he has to conceal or vary from the truth, and if the recording angel notices it at all he is not very busy with this class of sins. Truth is often too painful and would be positively brutal. The Japanese are the gentlest souls that ever killed a Russian; they would not hurt one's feelings for the world. If they think the truth is painful they never give it, and they are said to be the most accomplished liars on earth—but always to prevent pain, never to deceive for the purpose of deceit. After all, the whole question is an evidence of the curious excitability of people on impossible subjects. Therapeutic falsehoods, that is, concealment of the truth, or variations from the truth, to save life, do not come under the definition of lying at all or deceit for the sake of the deceit itself.

The possibility of acclimation in the tropics is a matter of great practical importance to the medical profession, as there is scarcely a physician who is not consulted for an opinion as to whether or not some particular person could not safely accept employment in Panama or the Philippines. It is of great public importance, also, as the government cannot secure the grade of employees it needs if it cannot give some assurance to applicants that there is a reasonable chance for survival. The desire to place the matter in as good a light as possible has led a few lay officials to minimize the dangers and make statements which have caused smiles in life insurance circles. Statistics have been so shamefully misused as to have cast considerable discredit upon all statements emanating from the tropics. It is well

known that the deathrate in every lower race is enormous, and compensated by an equally large birthrate, facts as true for Arctic regions as for the tropics. The higher the civilization the less are these rates the world over. Nevertheless, the larger deathrates of the natives of Panama and the Philippines are seriously considered as proof that the respective climates are more fatal to the natives than to the white invaders. The last one to make this curious deduction is Dr. Wm. S. Washburn,¹ chairman of the Philippine Civil Service Board. He also makes the surprising announcement that, with the exception of places of excessive heat, moisture and unhealthy soil conditions, acclimation or physiologic adaptation of the white man to tropic environments is possible, and that if acclimation is possible, so is colonization. Since failure has resulted from every attempt to colonize the tropics—and untold thousands of attempts have been made—his conclusion will not be accepted by the medical profession until some white colony has been successfully maintained in the tropics.

Acclimation of lower animals is not possible if the new climate is markedly different from the native one. No naturalist ever doubts that. The deathrate in zoological gardens is very great even with all the care to imitate the natural environment of each species. The same law holds as to man. The characters he has developed in any one locality make him adjusted to that place and to no other. Nature is not such a stupid workman as to make all these differences for no purpose. The only way to survive in a new climate is to find out what is injurious and then guard against it—that is, try to imitate the normal environment. It has been discovered that most of the past mortality was due to infections and therefore modern sanitation stepped in to reduce the deathrate to a point but very little different from that at home. As a matter of fact the deathrate of Americans in the Philippines should be far less than in the United States if the officials do their duty by the sick—send them home as soon as it is found that recovery is not probable in the tropics. Washburn shows that the sick and deathrates of Americans steadily decrease year by year of residence, and calls it acclimation. It is probably the survival of the most resistant—the others went home or died. He also thinks that the large deathrate in campaigns is inevitable and invariable, but it does not seem to have resulted from the late Japanese invasion of Manchuria—at least so far as we have heard. When it does occur in the tropics it is partly due to exposure or climatic adversities which can be avoided in garrison life. He con-

cludes that tropical sickness is partly due to immorality and failure to observe rules of health. Both accusations will be resented by many men who have come home more or less wrecked in health in spite of their morality and care. He finally states that residence in the Philippines is attended with as little danger of disease and death as in the United States under similar sanitary conditions—a conclusion which indicates dreadful mismanagement to produce the stream of invalids sent home. It is quite evident that there is need of more exact information, and that such rosy publications will have the effect of blinding laymen to the real dangers of the tropics. Actuaries of life insurance companies are not blinded and keep up their premiums just the same.

Japanese Military Medical Methods.—Shunzo Takaki, son of Baron Kanhila Takaki, one of the chief medical officers of the Japanese Navy, is reported by the *Kansas City Times* to have said:

"The extraordinary success of Japanese surgeons in the military and naval branch of the service in saving lives of wounded prisoners and guarding against both epidemic disease and fevers has been in no way due to any secret knowledge possessed by the physicians. The surgeons of the American service could have done the same thing under the same conditions. The Japanese administration broke away from any traditions by giving the medical department more power than such officers had possessed hitherto. The army in the field never camped until the site selected had been approved by the medical officers. The soldiers never drank water until it was either boiled or the stream or spring marked by the medical department 'Fit for Drinking.' The food supplied to the soldiers was prescribed by the medical department and the time of feeding was also under the control of that branch. Japan recognized, in fact, that battles are won by healthy men as well as modern weapons. And we think that it is cheaper to save the life of a wounded soldier who has been trained and who has seen active service than it is to take a raw recruit and make of him as good a soldier. We think that the worst thing you can do with a wounded soldier is to let him die. But your own medical officers can do as well when you recognize the surgeon as an integral part of your war department and not an adjunct to toil on behind the army and only to go forward when there are dying men to help. In principle our medical department marches in front of the army and yours marches behind. When people think of the Japanese they always think—of rice; but you should understand that we are not 'rice eaters' in that way any more. Now we eat rice as you do corn. It is one of our staples, that's all. Some years ago my father investigated the 'beriberi' disease, a sort of dropsical scurvy that our sailors were suffering from, and he discovered that undue consumption of rice was one of the principal causes of the trouble. He at once ordered the reduction of the rice supply. Its place was taken by other food. And that reminds me of an illustration that will show the difference between our naval medical department and yours. There has been some complaint recently about the food supplied to the sailors in the American navy. You sent a sailor, Admiral Robley Evans, to report upon the matter. We would have sent a committee of physicians skilled in dietetics."

The Plague Revisits Sydney, N. S. W.—Two cases were reported one day last week, and three more were discovered the next day in the same block of houses.

¹American Journal of the Medical Sciences, September, 1905.

AMERICAN NEWS AND NOTES

GENERAL.

Canal Zone's Healthful Condition.—Colonel Gorgas reports for the month of February that no case of yellow fever or other quarantinable disease occurred within the Canal Zone. Among the 23,000 canal employes the deaths numbered 7 white and 29 negroes. Only one American died.

Canal Zone Medical Society.—The Canal Zone physicians met last week in Panama and organized a medical society. A. B. Herrick was elected temporary chairman and Colonel W. C. Gorgas chief sanitary officer. Captain Ira A. Shimer and Dr. Bates were appointed a committee to draw up by-laws.

Milk in Powder.—After experiments for over a year, Professor Cavanaugh, of Cornell, has discovered a process to extract the material from the watery part of milk. He has demonstrated to the satisfaction of a large chemical company that his solution of the problem is of great practical value, and the company will soon protect the discovery by patents and be able to distribute pure milk in powdered form, needing only the addition of water to return it to its natural form.

Distribution of Samples Prohibited.—Selma, Cal., has passed an ordinance providing that any person who distributes samples of any patent or proprietary medicine in the town, by delivering samples or small quantities thereof to minors, or by leaving samples or quantities thereof on the streets or in the yards, or in and about any buildings of said town, or who advertises any medicine or drug of medicinal preparation, by leaving samples or small quantities thereof, where the same are likely to fall into the hands of or be picked up by any minors in said town, shall be guilty of a misdemeanor.

New Quarantine Law.—The House Committee on Interstate and Foreign Commerce agreed last week to make a favorable report on a committee substitute for the Williams bill to extend Federal control of quarantine. One amendment extends Federal control to interstate quarantine. The other amendment provides that when the Government acquires property for quarantine use the States shall release all rights to the property when the purchase price is paid. The bill provides for the establishment of four harbors of refuge, of which Dry Tortugas is to be one, and carries an appropriation of \$500,000 to carry its provisions into effect.

EASTERN STATES.

For a Chair of Nervous Diseases.—At the last meeting of the president and fellows of Harvard University, a gift of \$50,000 was received from Louisa N. Bullard to establish a professorship of neuropathology in the Harvard Medical School. The professorship is to be known as the Bullard Professorship in honor of William Story Bullard, husband of the donor, and is to be used in the advancement of the study of nervous and mental diseases.

NEW YORK AND VICINITY.

Hope for Osteopaths.—It is reported that osteopaths stand a good chance of obtaining legislative recognition. Their bill, which puts osteopathy on the same footing with the practice of medicine, has won the support of Senate and Assembly leaders, and assurances have been given that it probably will pass both houses.

Teachers Must be Vaccinated.—Every principal and teacher of the public schools in Paterson, N. J., will have to submit to vaccination unless they can show that they have been inoculated within a stated number of years. The smallpox scare resulting from the number of cases that have been found in the Prospect Park Borough has resulted in this order being issued.

Anthrax Ravaging Jersey Farms.—A peculiar disease, symptoms of which indicate anthrax, is killing off the cattle and horses of farmers round about Newton, N. J. The chief sufferer owns a big dairy near Newton. He first noticed the disease last week, and a veterinarian made an examination of the blood of one of the dead animals. He sent to the State Board of Health laboratory a sample of the blood and gave them his diagnosis of anthrax for verification.

Will Prosecute Druggists.—Prosecutions against persons in the southern section of New York City have been begun by the State Pharmaceutical Board, alleging violations of the law regarding the compounding of prescriptions by drug clerks who are without the necessary certificates of examination. Several men have been placed under bail and others will shortly be taken into custody. The quarterly examination of applicants for druggists' certificates will be held by the board. About 50 students will be examined. The law passed by the last Legislature specifies that only graduates from reputable colleges will be permitted to take the examination.

To Expose Patent Medicines.—The Senate Committee on Public Health of the New York Assembly gave a hearing last week on the Stevens bill, which compels the placing of the formula on all patent medicine packages. Several amendments will be inserted in the bill as a result of knowledge gained by the committee. The chief amendment will be one making it a felony to sell opium or cocaine without a physician's prescription, and a felony also for a physician to prescribe it unless it shall be for purely medicinal use. William Jay Schiefelin, a New York drug manufacturer and importer, declared that 20% of the cocaine manufactured in this country was used by cocaine fiends, and that of the 250 white girls, some no more than 14, now living in Chinatown, New York, 60% were cocaine and opium fiends. The opponents of the Stevens bill, from taking a flat stand against it, changed before the end of the hearing to the point where they agreed with its principle, but expressed the belief that the methods of its working out should be changed somewhat.

PHILADELPHIA, PENNSYLVANIA, ETC.

Pollution of the Schuylkill.—Inspectors of the Philadelphia Health Bureau have begun to investigate pollution of the Schuylkill river from the upper end of the Twenty-second ward.

Fresh Outbreak of Typhoid.—Records of the Philadelphia Bureau of Health show that there has been a fresh outbreak of typhoid fever during the last week. The condition of the drinking water is assigned as the cause. New cases reported numbered 287, an increase of 56 over last week. Measles gives evidence of subsiding. During the week 601 new cases were reported, as compared with 629 during the previous week.

Immigrant Admitted at Ellis Island Has Smallpox.—The case of Celia Borgur, a Hungarian, who is dangerously ill of smallpox, has been placed in the hands of the State Health Department. The immigration authorities of New York permitted the woman to pass the quarantine station on Ellis Island upon her arrival in this country a few weeks ago, although she had no vaccination marks, as the immigration law requires. Commissioner Dixon will make a thorough investigation and hold the proper officials responsible for any neglect of carrying out the immigration laws.

The Libel Suit against the Ladies' Home Journal.—A jury of the Supreme Court at Buffalo, N. Y., recently awarded the "World's Dispensary Medical Association," proprietors of a "patent medicine" known as "Dr. Pierce's Golden Medical Discovery," \$16,000 damages in a suit for libel against the Curtis Publishing Company, publishers of the *Ladies' Home Journal*.

The libel consisted in a statement, afterward retracted, that this particular medicine contained opium, digitalis, alcohol. The suit was originally brought for \$200,000, and the award was so small that the plaintiff immediately made a motion for a new trial on the inadequate damages.

SOUTHERN STATES.

Department of Richmond, Va., has a bacteriologic laboratory, with the object of dealing with the bacilli of diphtheria, cholera, and typhoid. It is now possible for physicians to detect the disease much earlier than was formerly.

Quarantine against Honduras.—On an outbreak of fever at Puerto Cortez, Honduras, the Quarantine Board of Mobile has ordered the quarantine against that port and made regulations for the entrance of shipping without five days' notice.

Quarantine Lifted.—The quarantine on the New York, Del., County Workhouse, caused by an outbreak of smallpox, has been lifted, and 47 prisoners whose terms had expired were released, and 42 who had been confined temporarily at the county Court House were sent to Greenbank.

No Yellow Fever in New Orleans.—Unanimous agreement of the physicians from the visiting States of the South, of the local physicians, and of the representatives of the Federal Government, that the patient did not have yellow fever, was the result of the autopsy held on the body of Jules Ebreuse, who died in the Charity Hospital, and whose case had been reported as yellow fever by one of the local physicians. No other suspicious case exists in New Orleans.

The Harriet Lane Home for Invalid Children, founded by the late Harriet Lane Johnson, niece of President Buchanan, will be located on the Johns Hopkins Hospital grounds at Baltimore, Md. The bequest amounts to several hundred thousand dollars. The home is for white children, with preference for boys and those living in Maryland, Pennsylvania, and the District of Columbia. The home is to pay the cost of operating its buildings and the agreement is to run for 20 years.

WESTERN STATES.

No Revocation of License.—The Supreme Court of California has annulled the action of the State Board of Medical Examiners revoking the license of "Dr." Jessie C. Hewitt, of Los Angeles, who advertised a cure for cancer. The court took its action on the ground that the medical law is "vague, indefinite, and uncertain."

Plans a Sanatorium.—James Eads How, of St. Louis, Mo., the eccentric philanthropist who refused to accept an inheritance because, he said, he did not have any right to money he had not earned, and who is spending his life in philanthropy, is now planning to establish a sanatorium for inebriates and victims of drug and cigaret habits. To this end he is trying to get possession of the old City Hospital building. In his medical studies How has given considerable attention to the study of the effect of drink, drugs, and cigarets. He believes that hundreds of men can be saved from being utter wrecks by a course of treatment.

Euthanasia Bill in Iowa.—"A bill for an act requiring physicians to take human life" was the title of a measure which was introduced in the Iowa Assembly by Representative Gregory, a physician, last week, who explains it as "nothing but common legislation, to reduce suicides, put an end to needless pain and prevent the rearing of idiotic, hopelessly diseased or hideously deformed children." By the terms of the bill any person of sound mind over ten, enduring great physical pain

and believing death inevitable, may call upon a physician to take his life by artificial means. It then becomes the compulsory duty of such physician to summon two other reputable physicians and the county coroner into consultation. If they agree that death is inevitable or prolongation of life would be attended by extreme pain, they shall then apprise the next of kin or guardian, and upon the latter indorsing the patient's request, they are required to administer some anesthetic to the patient until life is extinct. Verified reports must then be made to the State Board of Health. In the case of those of unsound mind or of children, the parent must take the initiative. Otherwise the procedure is the same.

FOREIGN NEWS AND NOTES

GENERAL.

Persia is Plague-stricken.—News from Seistan, in Eastern Persia, says that a pest is spreading, that the populace is becoming panic-stricken, and that many persons are fleeing.

More Typhus Fever at Mexico City.—Twenty-six new cases of typhus fever have been reported in Mexico City, and two deaths. The total number of cases since October 1 is 2,277, with 558 deaths.

OBITUARIES.

William T. Bacon, aged 60, March 16, at his home in Hartford, Conn. He was graduated from the University of the City of New York in 1871. He devoted his attention to the eye and ear diseases. He was a member of the American Ophthalmological Society, the American Medical Association, Society Ophthalmic and Aural Surgery, and various State and local societies.

Alonzo H. Boyer, aged 60, March 17, at his home in Philadelphia. He was graduated from the University of Pennsylvania in 1868; was a member of various State and county medical societies. He served as assistant surgeon of the 200th Pennsylvania Volunteers during the Civil war.

Lawrence J. Gerold, aged 41, March 15, from heart disease, at Bath, N. Y. He was graduated from Baltimore Medical College in 1901, and was serving as assistant surgeon of the State Soldiers' Home Hospital, Bath, N. Y., at the time of his death.

William G. Niles, aged 26, resident physician at the Presbyterian Hospital, Philadelphia, March 16, from pneumonia. He was graduated from Jefferson Medical College in 1904.

Leopold Hirschmann, aged 35, March 15, at his home in New York City. He was graduated from Cornell University, medical department, in 1899.

William N. Riley, aged 28, March 16, suddenly, at his home in Malden, Mass. He was graduated from Harvard University Medical School in 1901.

Charles Louis Fincke, aged 33, March 19, at his home in Brooklyn, N. Y. He was graduated from Long Island College Hospital in 1899.

Samuel Gamble, aged 25, March 18, at his home in York, Pa. He was graduated from the Medico-Chirurgical College, Philadelphia.

Henry C. Barton, March 12, from typhoid fever, at his home in Philadelphia. He was graduated from Jefferson Medical College.

THE PUBLIC SERVICE

Changes in the Medical Corps of the U. S. Navy for the week ended March 17, 1906:

H. A. DUNN, passed assistant surgeon, detached from the naval proving ground, Indian Head, Md., and or

dered to the Princeton.—J. B. MANCHESTER, assistant surgeon, detached from the Princeton and ordered home to wait orders.—M. W. BAKER, passed assistant surgeon, detached from the Naval Hospital, Washington, D. C., and ordered to the Naval Hospital, New York, N. Y.—F. D. CHAPPELEAR, acting assistant surgeon, ordered to the Naval Hospital, Washington, D. C.—C. D. LANGHORNE, surgeon, detached from the Denver and ordered home to wait orders.—G. P. LUMSDEN, surgeon, detached from the Olympia, when put out of commission, and ordered to the Minneapolis.—O. D. NORTON, surgeon, detached from the Minneapolis and ordered home to wait orders.—R. W. PLUMMER, passed assistant surgeon, detached from the naval subrecruiting station, St. Joseph, Mo., and ordered to the Denver.—W. B. SMITH, assistant surgeon, detached from the Olympia, when put out of commission, and ordered to the Hancock.—I. F. CONE and J. FLINT, assistant surgeons, appointed assistant surgeons, with rank of lieutenant, junior grade, from February 28, 1906.

Changes in the Medical Corps of the U. S. Army for the week ended March 17, 1906:

Lieutenant-Colonel WILLIAM B. DAVIS, Deputy Surgeon-General, is relieved from duty as chief surgeon, department of the Columbia, and will proceed to New York City and report to Lieutenant-Colonel Henry S. Turrill, Deputy Surgeon-General, in charge of the medical supply depot in that city, for temporary duty. The following-named assistant surgeons are relieved from duty in the Philippines Division, to take effect at such time as will enable them to comply with this order, and will proceed by the first available transport sailing from Manila, P. I., after the dates set opposite their respective names, to San Francisco, Cal., and report by telegraph to the army for further orders: Captain Ewin P. Wolfe, July 1; Captain M. A. W. Shockley, July 1; First Lieutenant Herbert G. Shaw, June 1; First Lieutenant Haywood S. Hansell, July 1.—GEORGE H. CASADAY, dental surgeon, upon arrival at San Francisco, Cal., will report to the commanding officer, General Hospital, Presidio, of San Francisco, for duty, relieving Frank P. Stone, dental surgeon.—Dental Surgeon STONE will proceed to Fort Sam Houston for duty, relieving Clarence E. Lauderdale.—Dental Surgeon LAUDERDALE will proceed to San Francisco, Cal., and take the first available transport sailing from that place for the Philippine Islands, and upon arrival at Manila will report to the commanding general, Philippines Division, for assignment to duty.—The following-named dental surgeons are relieved from duty in the Philippines Division, to take effect at such time as will enable them to comply with this order, and will proceed by the first available transport sailing from Manila, P. I., after the dates set opposite their respective names, to San Francisco, Cal., and report by telegraph to the military secretary of the army for further orders: Rex H. Rhoades, May 3, and William G. Hammond, July 1.—ANDREW J. LYONS, sergeant first class, Fort Meade, will be sent to Fort Snelling for duty.—Major PETER R. EGAN, surgeon, will report to Major General James F. Wade, president of an army retiring board at Governor's Island, New York, for examination by the board.—Major ROBERT S. WOODSON, surgeon, leave granted February 9 is extended ten days.—Lieutenant-Colonel GEORGE H. TORNEY, Deputy Surgeon-General, in addition to his present duties will, upon the retirement from active service of Colonel John D. Hall, Assistant Surgeon-General, report to the commanding general, Department of California, for duty as chief surgeon of that department, and also assume the duties of medical superintendent of the army transport service at San Francisco, Cal.—First Lieutenant WILLIAM T. DAVIS, upon arrival in the United States, will proceed to Washington Barracks for duty with Co. A, Hospital Corps.—HARRY A. P. NEEL, contract surgeon, now at Philadelphia, Pa.,

will report to the commanding officer of Frankford Arsenal for duty.—Major FRANK R. KEEFER, surgeon, leave granted March 6 is extended one month.—A board of officers to consist of Major Louis A. La Garde, surgeon; Major Rudolph G. Ebert, surgeon, and Major William E. Purviance, surgeon, is appointed to meet at Manila, P. I., for examination of officers of the medical department for promotion or advancement. The junior officer will act as recorder and the professional examinations will be conducted under such instructions as the board may receive from the Surgeon-General of the army, through whom the record of the proceedings should be forwarded to the military secretary of the army.—The following-named officers will report on May 8 to Major Louis A. La Garde, surgeon, president of the examining board at Manila, P. I., for examination for advancement: First Lieutenants Patrick H. McAndrew, Gideon McD. Van Poole, George H. R. Gosman, James W. Van Dusen, Wallace De Witt, Robert M. Thornburgh, Robert B. Grubbs, Edmund D. Shortlidge, Peter C. Field, and Herbert G. Shaw, assistant surgeons.—JOHN WALTON, sergeant, upon his own application, will be placed upon the retired list.

Changes in the Public Health and Marine-Hospital Service for the week ended March 14, 1906:

H. W. WICKES, passed assistant surgeon, granted leave of absence for two days from March 16, 1906.—W. W. KING, passed assistant surgeon, granted leave of absence for one month from March 12, 1906.—JOE GOLDBERGER, passed assistant surgeon, granted leave of absence for 21 days from April 11, 1906.—J. W. AMESSE, passed assistant surgeon, directed to proceed from Ellis Island, N. Y., to New Orleans, La., for special temporary duty in the State of Louisiana.—J. T. BURKHALTER, passed assistant surgeon, granted extension of leave of absence for 10 days from March 2, 1906.—J. S. BOGGESE, assistant surgeon, granted three days' leave from March 12, 1906.—W. C. RUCKER, assistant surgeon, relieved from temporary duty at Vineyard Haven, Mass., and directed to proceed to New Orleans, La., for special temporary duty in the State of Louisiana.—F. C. SMITH, assistant surgeon, directed to proceed from Detroit, Mich., to New Orleans, La., for special temporary duty in the State of Louisiana.—B. W. GOLDBOROUGH, acting assistant surgeon, granted two days' leave of absence from March 14, 1906.—N. D. RICHARDSON, acting assistant surgeon, granted leave of absence for 30 days from March 7, 1906.—CHAS. W. STEPHENSON, pharmacist, granted leave of absence for 30 days from March 12, 1906.

Boards Convened.—A board of medical officers was convened to meet at the Bureau, Washington, D. C., April 2, 1906, to determine the fitness for promotion to the grade of surgeon of certain passed assistant surgeons. Detail for the board: Assistant Surgeon-General W. J. Pettus, chairman; Assistant Surgeon-General J. M. Eager, and Surgeon L. L. Williams, recorder.

A board of medical officers was convened to meet at Mobile, Ala., March 17, 1906, for the physical examination of an officer of the Revenue Cutter Service. Detail for the board: Passed Assistant Surgeon Edward Francis, chairman; Acting Assistant Surgeon A. S. Taylor, recorder.

A board of medical officers was convened to meet at Chicago, Ill., March 13, 1906, for the physical examination of an officer of the Revenue Cutter Service. Detail for the board: Passed Assistant Surgeon G. B. Young, chairman; Passed Assistant Surgeon S. B. Grubbs, recorder.

A board of medical officers was convened to meet at the Bureau, Washington, D. C., March 15, 1906, for the physical examination of an officer of the Revenue Cutter Service. Detail for the board: Assistant Surgeon-General J. W. Kerr, chairman; Assistant Surgeon J. W. Trask, recorder.

SOCIETY REPORTS

THE SOUTHERN SURGICAL AND GYNECOLOGICAL ASSOCIATION.

Eighteenth Annual Meeting, Held in Louisville, Ky.,
December 12, 13, and 14, 1905.

[Specially reported for *American Medicine*.]

[Continued from page 380.]

Scopolamin-Morphin-Ethyl Chlorid-Ether Anesthesia.—H. A. ROYSTER (Raleigh, N. C.) said that of all the combinations suggested for aiding and abetting these agents, that which formed the subject of his paper commended itself to him, because he believed, first, that ether was our safest general anesthetic; second, that ethyl chlorid secured the pleasantest primary narcosis; third, that the preliminary use of scopolamin with morphin increased the patient's mental resisting power and lessened the quantity of ether. In his opinion there could be no question of the superiority of ethyl chlorid over nitrous oxid gas as a preliminary to ether anesthesia. Its action was more certain and constant and equally agreeable, and he could not help feeling that it was safer. His experience in regard to the combination of morphin and scopolamin was confined solely to the use of these drugs prior to the administration of ether. Of those who had investigated scopolamin, some state that it was isomeric with hyoscin; others that the effect in the combination was due largely to morphin; still others that the drug was dangerous and uncertain in its action. Its most marked effects were in quieting the nerves and fears, the promotion of an easy courage in beginning the anesthetic, and a prolongation of the restful sleep afterwards. Clinical tests had led him to conclude that scopolamin was not identical with hyoscin, and that it did something more than morphin alone, and that it was safe in proper doses. He sounded a note of warning in regard to the use of scopolamin, inasmuch as several deaths had followed its employment.

Overlapping the Aponeuroses in the Closure of Wounds of the Abdominal Wall.—CHARLES P. NOBLE (Philadelphia) recommended a method of overlapping the aponeuroses, which he had used with the utmost satisfaction for nine years, in the closure of all wounds of the abdominal wall, including the Alexander operation, inguinal and umbilical hernia, diastasis of the recti muscles, appendectomy, and nephrorrhaphy. In but a single case did he know of a postoperative hernia where the abdominal wound had been closed by this method. When drainage was employed through the abdominal wound, the method was not applicable. The technic of the operation was illustrated by several drawings which demonstrated the method clearly. He closed his article by describing the methods of overlapping the fascias employed by Lucas-Champonnière and E. Wyllys Andrews in the operation for inguinal hernia.

The Early Diagnosis and Radical Cure of Carcinoma of the Prostate, with a Report of 40 Cases.—HUGH H. YOUNG (Baltimore, Md.) presented these conclusions, which were drawn from the study of 40 cases: Carcinoma of the prostate was more frequent than was usually supposed, occurring in about 10 percent of the cases of prostatic enlargement, as shown also by Albarran. It might begin as an isolated nodule in an otherwise benign hypertrophy, or a prostatic enlargement which had for many years furnished the symptoms, and signs of benign hypertrophy might suddenly become malignant. Marked induration, if only an intralobular nodule in one or both lobes of the prostate in men past 50 should be viewed with suspicion, especially if the cystoscope showed little intravesicular prostatic outgrowth, and pain and tenderness were present. The posterior surface of the prostate should be exposed as for an ordinary prostatectomy, and if the operator were unable

to make a positive diagnosis of malignancy, longitudinal incisions should be made on each side of the urethra, as in prostatectomy, and a piece of tissue excised for frozen sections, which could be prepared in about six minutes and examined by the operator at once. If the disease were malignant, the incisions might be cauterized and closed, and the radical operation performed. Cancer of the prostate remained for a long time within the confines of the lobes, the urethra, bladder, and especially the posterior capsule of the prostate resting inviolate for a considerable period. Extraprostatic invasion nearly always occurred, first along the ejaculatory ducts into the space immediately above the prostate, between the seminal vesicles and the bladder, and beneath the fascia of Dénouvilliers. Thence the disease gradually invaded the inferior surface of the trigone and the lymphatics leading toward the lateral walls of the pelvis, but involvement of the pelvic glands occurred late, and often the disease metastases into the osseous system without first invading the glands. Cure could be expected only by radical measures, and the routine removal of the seminal vesicles vasa deferentia, and most of the vesical trigone with the entire prostate, as carried out in four cases by the author and fully described by the illustrations, was shown to be necessary by the 40 cases, including 8 autopsies and 10 operations. The 4 cases in which radical operation was done demonstrated its simplicity, effectiveness, and the remarkably satisfactory functional results furnished.

[To be concluded.]

WESTERN SURGICAL AND GYNECOLOGICAL ASSOCIATION.

Fifteenth Annual Meeting, Held in Kansas City, Mo.,
December 28 and 29, 1905.

[Specially reported for *American Medicine*.]

[Continued from page 380.]

President's Address: Twentieth Century Surgical Problems.—Delivered by H. D. NILES (Salt Lake City, Utah). No one who had kept in touch with our recent experiences in the surgery of the brain, lungs, pancreas, spleen, peritoneum, and other organs, could escape the conviction that with a clear, definite idea of the physiology of these parts, the result of surgical endeavors would be infinitely more satisfactory than we were able to obtain with our present knowledge. In brain surgery our many failures could not be charged to any lack of operative skill, but to inability to locate accurately the exact pathology early enough to insure its safe removal or correction. The same might be said of the morbid conditions of the spleen, pancreas, and in a degree of the stomach. Until we were better informed by the physiologist of the normal functions of these organs, we could not hope always to differentiate between the normal and the abnormal. The evidence that pointed to the one and excluded the other could only come to us through concentrated, specialized efforts which the average surgeon was technically unfitted to undertake. The line that divided surgical diseases from nonsurgical was still somewhat vague and indistinct, and one of the most common sources of error in treatment arose from the fact that we were often in doubt as to when and how far we might safely trust to the reparative resources of nature, and under what conditions prompt operative interference should be resorted to. Thus far success in surgery had been measured largely by the ability to cope with advanced disease after it had become an immediate menace to life and health. But the time could not be far distant when the importance of recognizing the antecedent pathology of cancer, ulcer, surgical kidney, pus tubes, prostatitis, and many other grave lesions, would be impressed upon the profession, and the public would be educated to choose preventive rather than last resort surgery. If we were ever to solve the problems that

baffled our endeavors today, and place surgery upon a much higher plane than it now occupies, he thought scientific workers must become more practical; practical workers must become more scientific, and physicians and surgeons must become more nearly united in their ideas of pathology and treatment. And this could only be accomplished by an organized movement tending to bring all workers into closer touch and sympathy with one another.

Chylous Cysts of the Mesentery.—MILES F. PORTER (Fort Wayne, Ind.) stated that a study of the literature, together with the reports of 20 cases, including one of the author's, formed the basis of his paper. The literature was very meager; the best of it was to be found in current publications. The history was bound with that of mesenteric cysts in general. Cysts of the mesentery were first classified by Portal, in 1803. Killian reported the first chyle cyst treated surgically, but Bramann's was the first one operated. Carson was probably the first in America to report a case of chylous cyst treated surgically. These cysts were very rare, more so than were serous cysts. The origin of chyle cysts must be regarded as manifold. They may be single or multiple, unilocular or multilocular, and multiple cysts might become multilocular single cysts and later unilocular by pressure absorption. Nothing is distinctive in chylous cysts save their contents and location. An exact diagnosis was neither possible nor necessary. A centrally located movable tumor crossed by bowel would be almost diagnostic of mesenteric cyst. Puncture for diagnostic purposes was condemned. Belly pain was a common symptom, and recurrent attacks of pain accompanied by vomiting and other symptoms of bowel obstruction were very significant. Chronic increasing constipation was a frequent symptom. A history of trauma was common. The treatment was surgical and the technic would depend on the findings in each case. The fear of permanent chylous fistula in cases treated by drainage was unfounded.

Preoperative Thrombi in the Region of the Field of Operation as a Cause of Postoperative Complications and Death.—A. W. ABBOTT (Minneapolis, Minn.), in a paper with this title, said that thrombosis, especially of the veins, was often to be found, if looked for in the vicinity of the field of operation. They might result from the pressure of a tumor, from cancer or tuberculosis, etc., or might be the result of adjacent inflammation or traumatism. Usually no attention was paid to the condition. Thrombosis in the field of operation increased the danger. Were there any practical methods for avoiding these dangers? The author believed that many cases of fatal sepsis, pulmonary embolism, and particularly many cases of so-called ether pneumonia could be rightly ascribed to the infection of a clotted vein or its disturbance by rough handling, or both, that were otherwise inexplicable; so also pyemia, abscess of the liver, osteomyelitis, and other evidences of metastatic infection. Aural surgeons had formulated a definite operation for thrombi of the lateral and sigmoid sinuses, namely, ligation of the internal jugular vein and clearance and drainage of the sinus. This was an eminently successful operation, considering the desperate condition which called for the interference, and, so far as the speaker knew, was the only established operation for thrombosis complicating operation. He thought a similar course should be pursued in all operations complicated by thrombosis.

Gluteal Cavernous Angioma.—J. E. SUMMERS, JR., (Omaha, Neb.) reported a case and said that cavernous angiomas of voluntary muscles were comparatively rare and in the case of this report the size of the growth was exceptional. It was excised while the circulation was controlled by direct digital pressure of the common iliac artery through an abdominal incision.

[To be concluded.]

CLINICAL NOTES AND CORRESPONDENCE

[Communications are invited for this Department. The Editor is not responsible for the views advanced by any contributor.]

THE ETHICS OF PROPRIETARIES IN RELATION TO ADVERTISING THROUGH HOSPITALS.

To the Editor of American Medicine:—A friend, the proprietor of a "standard proprietary," prescribed generally by the physicians of the world, asks me whether I should consider the following proposition ethical. I expressed my personal opinion and advised him that I would address the editors of two journals for their opinions also, so if you will kindly honor me with an expression I will be indebted to you:

My friend's concern is now spending in advertising, i. e., detailing, sampling, and mailing literature, the sum of \$75,000 a year. This money goes into circulation via salaries, railroad fares, printers, etc. His idea is to give the money so expended to the worthy and needy hospitals and dispensaries of the country. In this way he hopes to keep his product "green" in the physician's memory.

The proposed plan is to make an agreement with the hospital whereby it receives a percentage of the gross profit derived from the sales of the proprietary in its vicinity. After agreeing with the hospital, his representative calls on the attending staff and others and informs them of the plan. Here is where he hopes to make an impression upon the physician so that when an occasion arises the doctor will remember the preparation.

The contention of the promoter is that he will be distributing the \$75,000 he is now expending to "reach" the doctor in a way that it will do some good and hopes it will be so considered by the doctor and thus gain his good will.

I trust you will favor me with an expression regarding the ethics of the proposition.

M.D.

CONTROL OF NASAL HEMORRHAGE BY MEANS OF ADRENALIN CHLORID.

BY

M. B. McCAUSLAND, M.D.,

of Covert, Mich.

To the Editor of American Medicine:—A short time ago, Dr. Mulford, of Buffalo, reported three cases of severe nasal hemorrhage stopped by the injection of 10 drops of a 1 to 2,000 solution of adrenalin chlorid into the upper lip. I wish to add another case. Several days ago at 2 a. m., I was called to see an elderly lady who was bleeding profusely from the right side of the nose. The bleeding began at 9 p. m., while she was taking her bath and in spite of local applications of ice, etc., the bleeding continued. She had lost quite a quantity of blood and had become frightened. On inspection, the bleeding point could not be located. After spraying a 4% solution of antipyrin into the nose, the bleeding stopped in a short time. It reappeared again about 2 p. m., and I received a hurried call to see her. She was losing blood rapidly, so after cleaning out the nose, I injected 10 drops of a 1 to 2,000 solution of adrenalin chlorid into the upper lip on a line with the center of the right nostril as that was the nostril from which the blood came. The flow lessened almost at once and was stopped in about 10 minutes and did not reappear. The after-treatment consisted of gently spraying out the nose with Sella's solution after 48 hours and a diet containing a quantity of gelatin.

ORIGINAL ARTICLES

SOME PERSONAL OBSERVATIONS MADE IN PENNSYLVANIA AND IN TEXAS REGARDING MALARIAL FEVER AND THE ANOPHELES MOSQUITO.*

BY

ALBERT WOLDERT, M.D.,

of Tyler, Texas.

Malarial fever is an acute, infectious, inoculable disease, sporadic, epidemic, and endemic. It may occur during all seasons of the year. It is due to one cause only—the plasmodium of malaria. As all know, this was discovered by Dr. Alphonse Laveran in November, 1880. At that time he was in the French military service, working in Constantine, Algeria, but is now teaching in the medical school at Val de Grace, near Paris, France.

The malarial parasite is an animal organism belonging to the natural order *Gymnosporidia*, class sporozoa, and is divided into different species, namely, *hemameba malaria* (quartan), *hemameba vivax* (tertian), and *hemomenas præcox* (Ross), or, according to others, *Laverania malariae*, causing the pernicious or remittent forms of fever, such as the estivoautumnal fever.

The fully-developed forms of malarial parasites may be either male or female. The life-history of this animal microorganism is an intricate process, subject to many difficulties which hinder the perpetuation of its species.

So well does it guard its own means of self-preservation, however, that it has chosen two hosts in which to complete its life cycle, which is to grow, to sporulate, and to propagate its offspring. In this respect it differs materially from many of the known infectious microorganisms.

It has been absolutely proved that the malarial parasite undergoes two distinct and totally different cycles of development, one occurring in the blood of man, the other in the middle intestine (or stomach) of the genus *Anopheles*. In man the first stage in the life cycle is represented by a small hyalin intracorporeal body about a twentieth the size of a red blood-corpuscle which has a rapidly dancing ameboid movement. Within from one to two days this hyalin body will have grown to be three-quarters to the full size of a red blood-corpuscle, and in its interior it will be seen to have accumulated certain minute black pigment granules, which are being lashed about in all directions. After a while this same parasite will be observed to undergo a subdivision into numerous segments and to sporulate into hyalin bodies again, which then reenter other red blood-corpuscles.

The development of the malarial parasite in the body of the mosquito is an entirely different process from that which occurs in the blood of man. When the malarial parasite is withdrawn from the circulation and allowed to stand for about 20 minutes upon a warm stage of the microscope flagellated parasites develop. This is the

same process which the parasite undergoes when it has been swallowed by the mosquito—flagellæ all developed from the full-grown parasites. Some of the full-grown parasites which have been swallowed by the *Anopheles* do not develop flagellæ and into these bodies certain detached flagellæ enter, with the result that a certain kind of fertilization occurs and after a short interval flagellæ do develop and these fertilized flagellated bodies are then endowed with the faculty of burrowing their way through the muscular layer of the mosquito's intestine (or stomach) and in the outer layer form small cysts or zygotes projecting into the abdominal cavity of this insect and looking like excrescences or warts. Within from seven to ten days these same oocytes or zygotes develop in the interior many hundreds of small spindle-shaped spores or sporozoites of malarial fever and later these zygotes become so distended by the great number of spores that they rupture in much the same way as does the mother tick when it is filled with seed-ticks. These spores on becoming free in the abdominal cavity of the mosquito will then be washed upward into the salivary glands of the mosquito to be poured out with the saliva into the blood of man the moment the insect bites, and each of these spindle-shaped spores (in the mosquito) will in man become converted into the small intracorporeal hyalin bodies and hence give rise to chills.

It should be remembered that the mosquito does not possess a heart nor a closed system of bloodvessels,¹ but that the blood (which is white in color) flows freely throughout its entire system, being propelled along the back by what is known as the dorsal vein, a mere tube open at both ends and which contracts and expands with each pulsation, so that it is an easy matter for the spores of the malarial parasite, or spores of other disease-producing microorganisms, to be distributed throughout the entire body of the mosquito. Therefore, in an infected *Anopheles* the spores are not all washed into the salivary glands, but may be found in all parts of its body. One may readily understand how easy it would be for such an infinitesimal body as the spores of this malarial parasite to be distributed throughout the body of the mosquito when they will recall that fully developed parasites as *Filaria sanguinis hominis* have been found after dissection in different parts of the body of the mosquito, including the salivary glands.

Just why one special kind of mosquito can act as the definitive host for the malarial parasites, while another genus does not seem to be able to do so, depends perhaps upon certain anatomic peculiarities and upon the nature of the tissue juices in certain types of mosquitoes. Nearly every step of the different processes mentioned has been closely followed by different investigators, including myself, and there is hardly one word of what may be called "theory" in it. Each step has been proved to be a demonstrated fact. In a number of instances infected mosquitoes have been allowed to bite man with the result that within a few days such persons have fallen ill of malarial fever and of the identical type of fever as that from which the parasites were derived. In one such instance infected mosquitoes were allowed to bite an individual in one of the hospitals of Rome and were placed inside of netting and carried to London, &

* An address (by invitation) made before the McLennan County Medical Society and Business Men's Club, Waco, Texas, September 12, 1905.

distance of over a thousand miles, and these infected mosquitos were then permitted to bite the son of Dr. Patrick Manson, with the result that within 10 days he developed the same type of malarial fever as that which afflicted the patient in Italy. Sometimes we hear of writers speaking of the mosquito as "stinging" a person. The mosquito does not sting, it bites. The mouth parts of the mosquito consist of an epipharynx or labrum; two mandibles for piercing tissues; two maxillas or jaws; and a hypopharynx. These parts when not in use are enclosed within a scale-covered sheath called the labrum.

PERIOD OF INCUBATION OF THE DIFFERENT FORMS OF MALARIAL FEVERS.

By experiments very carefully performed Marchiafava, Bignami, Grassi, Ross, and Koch have worked out the period of incubation of each of the varieties of malarial fever. Thus for the tertian fever the maximum period of incubation is 21 days, the minimum 6 days, or a general average of 11 days; for quartan the maximum period of incubation is 21 days, the minimum 11 days, or a general average of 14 days; and for estivo-autumnal the maximum period of incubation is 14 days, the minimum 2 days, or a general average of 6 days. As stated, the development of the malarial parasite inside the mosquito from the flagellated parasite to the spore stage is fraught with many adverse circumstances and dangers. Thus the parasite develops best at a temperature of about 85° F. and not at all below 65° F., so that it would be impossible for the *Anopheles* to become infected if it continued to live in the outdoor temperature in midwinter. The malarial parasite could not therefore develop in the arctic zone or where the temperature was constantly below the freezing point unless the infected mosquito hibernated in a warm atmosphere. But a patient in whom the malarial parasite lies dormant might be taken to the North Pole and be subject to chills even though there were no mosquitos.

If we consider the life cycle and the method adopted by different types of microorganisms to perpetuate its species, as for instance the micrococci, we will find that they multiply by fission. In other words, there is a cleavage along certain lines and one microorganism splits off into two microorganisms, thus producing the diplococci. Sometimes the cleavage occurs in three directions and sarcina are produced. If the cleavage always occurs in the same direction we have long chains of organisms and these are called streptococci, and if into groups the staphylococci. It will be remembered that the bacilli always divide by transverse fission, thus arranging themselves into distinct threads, some of which contain spores, such as the bacillus of tetanus, the bacillus of anthrax, etc.

The bacillus of bubonic plague and the bacillus of tetanus, as we all know, may grow and develop in the soil, but when one considers how simple the method of reproduction this is as compared with that of the higher type of microorganism such as the malarial parasite one can clearly comprehend how it is impossible for the malarial parasite to exist without having some kind of growing protoplasm in which to carry on its life proc-

esses. To perpetuate itself the malarial parasite must choose some kind of suctorial animal or insect which is capable of injecting it again into the blood of man. From one point of view we may say that the fact that the malarial parasite lives in the *Anopheles* is an accidental process, but on the other hand one may claim that on the part of the malarial parasite, at least, it is the result of a *natural selection*.

From what we know about the nature of yellow fever, viz., that in order to convey this disease *Stegomyia fasciata* must bite the patient within the first three days of the disease; that it must have a resting stage of some 12 days before it is capable of transmitting the disease back to man; that it is then capable of transmitting the disease for as long a period as 57 days; that if the drawn blood be filtered the serum if inoculated into a healthy man will give rise to yellow fever; and that if this filtered serum be heated to a temperature of 120° the infectious microorganism or its spores will be destroyed; and if we will by analogy reason from what has been truly demonstrated in the case of malarial fever we will be convinced that the yellow fever germ, whatever its true shape, form or size, must belong to the animal kingdom, as does the malarial parasite, and perhaps also to the natural order Gymnosporidia (Hemosporidia) and class sporozoa; and further, that it must undergo some similar development to that of the malarial parasite.

Koch has proved that the malarial parasite of man cannot be conveyed to the ape (*Hylobates agilis* and *Hylobates syndactylus*) and from this observation it is believed that the malarial parasite of the ape cannot be conveyed to man. Whether the malarial parasite of birds can be conveyed to man, I believe has not yet been tested.

We do know this much, that the malarial parasite is capable of hibernating in the blood of man throughout the entire winter, and I have reported two suspicious cases of this kind in the *American Journal of the Medical Sciences*, March, 1903.

In a routine examination of the blood of soldiers returning from the Philippine Islands, Craig (*New York Medical Record*, February 15, 1902) found the malarial parasite in 195 patients, 90 of the patients suffering from other diseases which masked the malarial attack, such as dysentery, rheumatism, indigestion, and the like; while he found 105 patients in whom the malarial parasite was present, and in whom no symptoms whatever existed.

While it might be a matter of pure speculation to presume that the germ of yellow fever might also hibernate in the blood of man, a simpler explanation is offered from the fact that, as we all know, yellow fever exists in South America throughout the year, and from this occurrence cases of the disease may readily come into American ports, or else infected mosquitos might be brought to such ports in trading and other vessels. Thus it is that South and Central America act as a perpetual menace to the inhabitants of the entire earth.

I have briefly reviewed the work done by other workers in the field of scientific investigation, and will now give some personal observations regarding malarial fever and the mosquito *Anopheles*. These observations

may be divided under two heads: History of observations in Pennsylvania, and history of observations in Texas.

HISTORY OF PERSONAL OBSERVATIONS REGARDING MALARIAL FEVER AND THE MALARIAL-CARRYING MOSQUITO (ANOPHELES) IN PENNSYLVANIA.

My first experiments to prove that the mosquitos of America act as the definitive host for the malarial parasite were made on the afternoon of December 29, 1899, while a resident of Philadelphia. The patient was a lad whose blood showed crescents and ovoid bodies, but after a trial of two hours the mosquitos refused to bite the patient, and my experiment, like many other first trials, proved to be a dismal failure. These mosquitos were specimens of *Culex* and, if my memory serves me right, had been kept in a glass fruit jar for a period of several weeks and fed upon bananas and a little sweetened water. At that time (1899) about all the knowledge I could get concerning the transmission of malarial fever through the mosquito was obtained from short abstracts of the work of Ross, Grassi, Marchiafava, Bignami, and later from Koch.

After the return of Dr. Ronald Ross to Liverpool from India, I put myself in communication with him concerning the subject, and he greatly aided and encouraged me in every way possible; and was good enough to lend me for study one of his first and best specimens.

At that time I was making a careful study of all mosquitos of Philadelphia, and also those sent to me from Texas, in which connection I wish to acknowledge my indebtedness to Dr. J. H. Sears, since deceased, who was kind enough to mail me specimens from Waco. Among these I had the pleasure of seeing my first specimen of *Anopheles punctipennis*.

The classification of the different mosquitos was made by Mr. C. W. Johnson, Curator of the Wagner Free Institute of Science of Philadelphia, and by Dr. L. O. Howard, Entomologist of the U. S. Department of Agriculture at Washington. At that time the special kind of mosquito instrumental in conveying the malarial parasite from man to man, and the one which was principally employed by Ross, Grassi, Marchiafava, and Bignami, was what was then called the *Anopheles* "claviger," and I now recall a special trip I made from Philadelphia to Washington to see Dr. Howard, who told me he knew of no species by the name of "claviger," but that the descriptions given of it abroad seemed to prove that it was our own *Anopheles quadrimaculata* (or *maculipennis*), and who showed me specimens of this species. I had also read of the descriptions written by Ross of how to identify the *Anopheles* larvae, and how they could be differentiated from the *Culex* larvae, in that the *Culex* larvae floated with head submerged, breathing through a spiracle at the end of its tail, while the larvae of *Anopheles* would be found to "float upon the surface of the water like 'sticks,'" "and when disturbed would wriggle away with a backward skating movement." So that in Philadelphia I began looking for that particular mosquito larva which lay upon the surface of fresh water like "sticks." I was the first one in Philadelphia to discover them. This occurred about noon on June 19,

1900, at which time I dipped up in a small tin cup several larvae with transverse stripes across the back, having a dark color, and which lay upon the surface of water like "sticks." They were discovered about two miles from the last row of houses skirting the city on the south, and about a mile north of the League Island Navy Yard, and were found in a small, slowly-flowing stream of fresh water coming from a marshy district and alongside a railroad embankment. It was my fourth visit to that neighborhood. This breeding-ground for the *Anopheles* furnished me the malarial-carrying mosquitos for nearly two years, during which time my subsequent investigations were carried on. In my visits to this stream where the *Anopheles* were breeding I saw numerous fish swimming about, and on one visit I believe I dipped up a perch, so that it does not always follow that to stock a stream or lake with fish will abolish mosquitos. On June 19, 1900, I made these notes: "It has been said that *Anopheles* larvae are not found where fish abound. However, within a few feet of where these *Anopheles* larvae were caught, two small fish—pike, about 3 inches in length—were seen resting near the surface of the water." The reason for this is due to the fact that *Anopheles* larvae lie in the green algæ and upon the top of it, so that they cannot be seen by fish. There were no larvae of *Culex* in the streams where the *Anopheles* larvae were found, though on the other side of the railroad embankment nearly all the larvae belonged to the genus *Culex*. The water was probably two feet in depth, and the *Anopheles* appeared to be mixed in with the greenish moss or algæ, since all were dipped up together.

Should anyone desire to find the breeding-ground of the malarial-carrying mosquito, I would advise him to first look for this greenish moss (or algæ); then for the larvae. Often the larvae cannot be seen until they have disintegrated themselves from the meshes of this greenish algæ.

On placing these larvae in a glass fruit jar, together with a small amount of algæ on which the larvae feed, and covering the top with mosquito netting I was rewarded several days later by finding full-grown specimens of both *Anopheles quadrimaculata* and *Anopheles punctipennis* inside the jar.

Subsequently I discovered four other breeding-grounds for the malarial-carrying mosquito in and near Philadelphia. One near the League Island Navy Yard; one in Oak Lane; one at Seventy-ninth street and Island road, and one in Woodside Park.

On July 29, 1900, the *Anopheles* larvae were more abundant than I ever saw, and I made a note stating that about 50 *Anopheles* larvae had been dipped up on that day. In 1900 I was informed that malarial fever was very infrequent and near League Island Navy Yard, but I have read of more recent reports which contradict this information.

As to the length of time an *Anopheles* may live I am unable to say, but I have kept them a few days longer than the Italian observers, my specimens living in captivity 27 days.

The longest period I have ever kept the *Culex* in captivity was from October 28 to December 28, or 60 days.

On September 10, 1900, I found *Anopheles* larvae in a spring branch in the Pocono mountains of Pennsylvania and at an elevation of some 8,000 feet above the sea-level. I learned that several miles toward the north (at Tobyhanna) malarial fever was more or less prevalent. In my investigations in Philadelphia I learned that the *Anopheles* larvae grew abundantly from June 19 until October 16, when, on account of cold weather, they began to disappear, and on November 11 I searched over one breeding-ground without finding any specimen of the *Anopheles* larvae. I had no trouble in catching a number of full-grown *Anopheles* on November 1, 1900, four of which died during captivity eight days later.

My observations in Pennsylvania and Texas demonstrated that the male mosquito became more numerous in cold weather and when frost came on, while the female gradually disappeared. In order to demonstrate more clearly the relation which the malarial-carrying mosquito bears to malarial fever, I will tell how one of the breeding-grounds for the *Anopheles* was found.

For several years in Philadelphia I was associated with several hospitals in the capacity of assistant physician to the out-patient department, and in this way I would occasionally come across cases of malarial fever in patients appearing for treatment. On one occasion a patient, aged about 20, came into my clinic at the Howard Hospital, and obtaining the correct address, which was some 10 miles from the hospital (Seventy-ninth street and Island road), I went to the house, but found no one at home. However, on searching a barn in the immediate neighborhood, I had no trouble in finding many full-grown *Anopheles quadrimaculata*, and some 200 yards from this barn I also discovered a breeding-ground for the *Anopheles*. At 5.30 p.m. on August 7, 1900, I selected several specimens of blood from the end of the finger of the patient, and stained the malarial parasites with methylene-blue and also by Manson's carbol-fuchsin method. But if I should be now called upon to designate more reliable stains I would name the Wright, the Nocht-Romanowsky, or the carbol-thionin stains. August 16, 1900, on going to the same neighborhood from which this patient came, I obtained the following interesting history of events to the inhabitants living within a radius of perhaps 100 yards:

"Mrs. D. had chills in 1899 and again in the spring of 1900; Mrs. M., a near neighbor, had chills in the early spring of 1900; Mr. W. had chills six weeks ago; Mr. D. had chills two weeks ago; Mr. R. had chills last week." It is also interesting to relate that every one of these patients, as well as the one who came to my clinic at the Howard Hospital, had suffered with chills recurring every two days. It goes without saying that somebody suffering with tertian chills was responsible for and started the epidemic of malarial fever in that locality.

I may add that in Philadelphia I never but once failed to find the malarial-carrying mosquito (invariably the *Anopheles quadrimaculata*) in the houses in which autochthonous cases of malarial fever prevailed. I might also note almost the same experience in Texas, except that in Texas I have not yet failed to find them. I might add that a distinguished physician of Philadel-

phia jocularly informed me that I would not find the malarial-carrying mosquito in that city.

During the period in which I was engaged in investigating the life history of the *Anopheles* I was also busy endeavoring to determine whether or not I could make the malarial parasite grow and develop in the middle intestine of the *Anopheles* in order to prove the claim that this insect does in truth and in fact convey from man to man the parasite of malarial fever. For 14 months I had been engaged in trying to prove this claim, and on November 1, 1900, I allowed several full-grown *Anopheles* to bite an individual in the charge of my friend, Dr. Frederick Packard, at the Pennsylvania Hospital, and in whose blood I had found both ovoid and flagellated parasites, and on Monday, November 5, while at work in Professor Simon Flexner's private laboratory at the University of Pennsylvania I dissected one of them and found four zygotes growing near the lower end of the middle intestine of the *Anopheles*.

Through the invitation of Dr. W. W. Keen, its president, I had the pleasure of presenting the specimen before the College of Physicians of Philadelphia on the evening of December 5, 1900, and again before the Texas State Medical Association, at Austin, in 1904.

This was the second successful result in America, Thayer's being the first, and he only preceded me by a very few months.

HISTORY OF PERSONAL OBSERVATIONS IN TEXAS.

Since my return to my native State I have not given up the search for the malarial-carrying mosquito, nor have I been discouraged in the work to eradicate the disease which it conveys. My first observations to discover the breeding-grounds of the *Anopheles* were made in and around Beaumont, Texas, and later in my home at Tyler. Up to this time I have found in Texas three different species of *Anopheles*, namely, *Anopheles quadrimaculata*, *Anopheles punctipennis*, and *Anopheles crucians*. *Anopheles quadrimaculata* (claviger or maculipennis) in my experience is by far the most prevalent species in Texas and in Pennsylvania.

June, July, and August, 1901, I spent in and around Beaumont, Texas, and during these months in the city of Beaumont I searched diligently for the *Anopheles* in the dwellings and hotels, and while there were hundreds of *Culex*, I never found one specimen of *Anopheles*. I do not at this time wish to condemn either Waco or Tyler for harboring the malarial-carrying mosquito and at the same time to give Beaumont a clear bill of health, since I have no doubt I could have found the *Anopheles* in the residences in the more remote parts of that city if I had taken the time.

Some 13 miles southwest of Beaumont at the little town of Fannett on the Gulf and Interstate Railroad, and in the open prairie, I found several breeding-grounds for the *Anopheles* as well as the full-grown specimens in certain houses. Malarial fever is more or less prevalent around that locality. The specimens obtained were *Anopheles quadrimaculata* and *Anopheles crucians*. While the *Anopheles* prefers to deposit its eggs upon slowly flowing streams of fresh water, I may say that near Beaumont on one occasion I found the larvae growing in

a barrel containing a small amount of rain water and some dead leaves and located within a few feet of an inhabited dwelling.

While on a fishing trip about two miles east of Beaumont (and in a dense forest) I had no trouble in finding many *Anopheles* in the top of the tent each morning. Some employes of a railroad construction party living in the immediate vicinity were suffering at that time with chills and dysentery.

In Tyler, Texas, I have discovered the *Anopheles* larvae in midwinter (December 21, 1902). At that time the temperature was almost at the freezing-point, and a rather severe freeze with ice had occurred several weeks previously.

On Monday, January 19, 1903, I found a very large full-grown female *Culex pungens*. This mosquito had been disturbed and flew from behind some old books stored in my office.

A very recent experience which occurred in a fishing party of which I was a member during August of 1905 may be of interest. Several of us had camped in a region adjacent to Saline Prairie, in Smith county, Texas, and also about a mile from the Neches river. We pitched our camp (covered by the dome of heaven) in the yard of an inhabited house, consisting of a family of several members. The rain ran several members of the fishing party into the house and several slept without a mosquito bar. Certain occupants of the house had a few days previously suffered with chills. Our party was driven by rain into this infected house on the night of August 7. On August 20, in spite of the fact that each one of our party had taken two or three 4-grain capsules of quinin, one member who had taken 12 grains a week or 10 days previously began to suffer from malaise, and later by fever, which on August 22 mounted to 102.4°. On the afternoon of this date I selected several specimens of blood from the tip of the finger, and after staining them by the Wright method, and also by the carbol-thionin method, I had no trouble in finding ring forms and other merozoites of the estivoautumnal parasites present. On obtaining a history of the family living in the house where the members of the party had spent the night of August 7 I learned that every member of the family had suffered with malarial fever except the father, who had for several years been in the habit of sleeping under a mosquito bar.

After spending two nights near the infected house we moved our camp over on the banks of the Neches river. The mosquitos here fairly swarmed about us during the daytime and were equally as bad at night. During the day I made careful observations, but never detected a single specimen of *Anopheles*, all being *Culex*. I do not wish to be understood as saying that *Anopheles* do not bite during the day, for at the infected house mentioned they bit severely about 2 p.m. on August 8, immediately before a rainstorm. At our camp on the Neches river I left my dark-colored umbrella open during the night, and on awaking in the morning found some 50 *Anopheles quadrimaculata* clinging within it. This was again repeated on the following night, with the result that about the same number of *Anopheles quadrimaculata* were found in the early morning of the following

day. These mosquitos had been attracted to our camp during the night hours. Mosquitos are attracted by colors which are dark or black, and therefore the interior of houses located in districts where malarial fever prevails should be painted white in color.

PREVALENCE OF MALARIAL FEVER IN TEXAS.

The people of certain districts in Texas are occasionally thrown into almost a panic when the existence of yellow fever is made known to them, and with unseemly haste prepare to fly from this plague visited upon them. It might be well for the people of this State if that day would come when the existence of chills and fevers in any district would cause an equal degree of anxiety. The feeling of security against malarial fever in Texas is entirely too complacent. Its ravages must be suppressed by the work of an efficient State Board of Health.

In a paper which I presented before the Texas State Medical Association at Austin in 1904, and which was printed in the Transactions, I called attention to the fact that one soldier in every seven stationed at the different army camps established in Texas by the United States government fell ill of malarial fever; of the total number of employes of three different railways traversing Texas, one employe in every four fell ill of malarial fever; and taking the city of San Antonio as an index as to what was occurring all over Texas, I learned if the statistics were absolutely correct that one person in every six in Texas suffered from malarial fever. I believe there are many mistakes made in the diagnosis of malarial fever, and that such statistics are too high. If we should say that mistakes in diagnosis are made in 50% of the cases, we would still find that one person in every twelve in Texas suffers with malarial fever, entailing a loss to the people amounting to upwards of \$5,000,000 a year, while over 3,000 people each year die of this disease. With the energy and resources of this great State behind it, and with the genius to baffle the tidal waves of the raging sea and to shut them out forever, the people of Texas must not hinder the hand of progress, but must keep it raised by creating within its confines a State Board of Health with power to wield the effective methods necessary to stay the hand of death and to destroy forever the enemy of all its people—malarial fever.

Diagnostic Value of Tuberculin in Orthopedic Surgery.—W. S. Baer and H. W. Kennard (Johns Hopkins Hospital Bulletin, January, 1905) believe that their own work, in competition with that of others, justifies the following conclusions: Tuberculin is the most reliable diagnostic agent for incipient tuberculosis of bones and joints. Its proper administration is attended by no permanent harmful effects. The dosage is variable and it is rarely necessary to exceed a dose of 6 mg. The local signs are of equal, if not greater importance than the general reaction in bone and joint tuberculosis. Tuberculosis practically always reacts to tuberculin. Diseases other than tuberculosis may possibly react to tuberculin, but the evidence on this point is not conclusive. The diagnosis can be made earlier and with more certainty by tuberculin than by radiography. [H.M.]

A MAN HAVING OCULAR MOVEMENTS SIMILAR TO THOSE FOUND NORMALLY IN THE UNGULATES.¹

BY

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of Buffalo, N. Y.

The study of the different steps of ocular development, beginning with the blind fish of the deep sea and ending with man, is intensely interesting; but even more so is the study of those rare human eyes which are capable of performing many functions found normally only in the animal.

There is a different structural formation of the eye in each natural order, making it possible to classify them as to order, family, genera, and species, without knowing to which animal the eye belongs, although at times it is nearly impossible to separate even the species of two



Fig. 1.

distinct orders, because of their similarity. The one apparently seems to be the continuation of the other, as if there had been an evolution of the eye. As an illustration of this let us compare the eye of the macaques rhesis² with that of the golden-eyed duck.

The eyes of these two animals are posteriorly soft and yielding. The anterior half is composed of a bony plate, which completely surrounds the eyeball and is covered in front by a circular cornea, over which at times is drawn a nictating membrane for protection while the monkey crashes through the trees and the duck while swimming under water. There is a round, central pupil in front of the lens which is nearly spherical in shape,

¹This patient was examined by Dr. Geo. M. Gould and photographs were shown by him at the meeting of the American Academy of Ophthalmology, held in Buffalo, September 14, 15, and 16, 1905.

²It is stated by many authorities that the simiae have no pecten; although it is very rare, I nevertheless found it in this monkey.

except the anterior one-third curves more rapidly than the posterior two-thirds, as if the lens had been divided

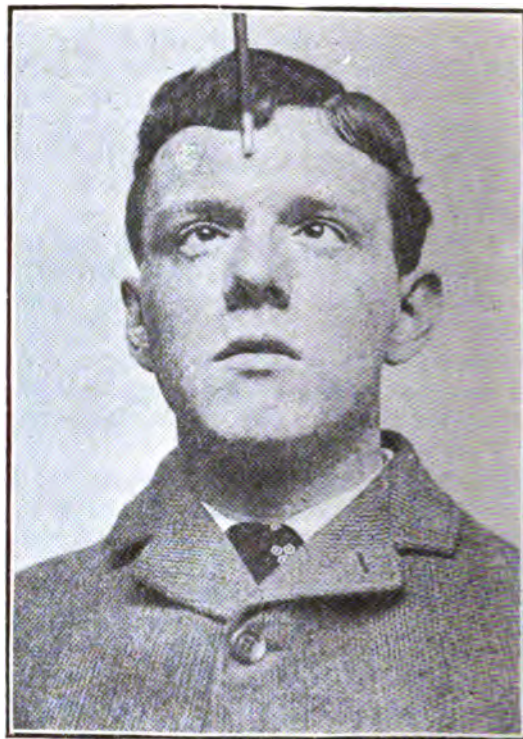


Fig. 2.

and from the anterior part a segment removed and re-joined. Their eyes do not accommodate by altering the shape of the lens, as in man, but by advancement,



Fig. 3.

caused by the expansion of a highly vascular body called the pecten, which springs from the optic disc. Accom-

modation by means of the pecten produces tension within the eyeball, which would cause bulging of the

shape. In the duck it is plum-shaped, but in the monkey it is round.

In the fish family amphioxus and myxine stand for



Fig. 4.

soft parts not protected by the orbit if it were not that the anterior part is surrounded by a bony plate. The only noticeable difference in these two eyes is in their

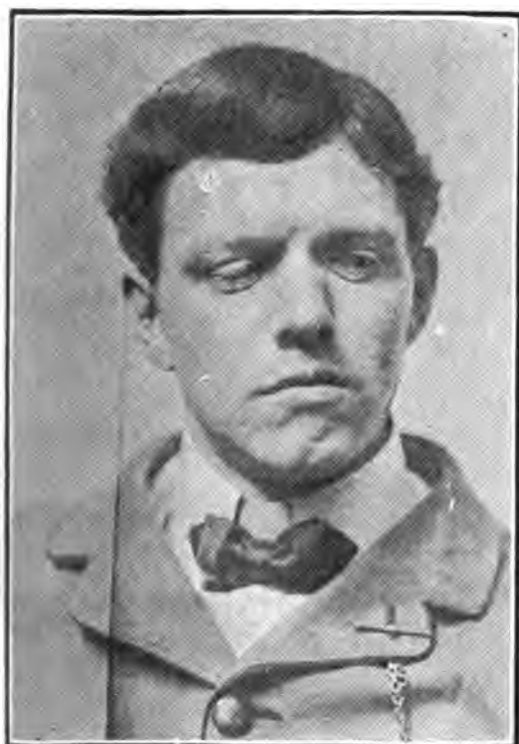


Fig. 5.



Fig. 6.

the lowest form of eye-development. The lens is imbedded in the retina, which as a whole is equally sensitive in all parts. These eyes, of course, are very simple



Fig. 7.

in their construction and have no power of seeing moving objects.

In crustaceans we find the daphnia has a number of simple eyes covered by a common cornea. These eyes

are usually hexagonal in form, although at times, as in the lobster, they are square.

Passing from the amphibious animals to those living exclusively in air, as the coleoptera, we find the eyes becoming more complicated, having now a lens, iris, and



Fig. 8.

pupil, as seen in the beetle, which is able to see moving objects, because each of its 25,000 eyes is turned in a different direction.

As development of the eye progresses, we find in the rodents and ungulates that the central part of the retina

is 180 degrees, but this is small in comparison with those animals having extreme pupillary width, round lenses, large corneas and retinas which have equal visual perception, for their fields overlap behind as well as in front. This is illustrated if one tries to touch the tail of the alligator or raise a whip behind a horse without blinders, for each will immediately see what is to happen.

So essential is lateral vision for the survival of the fittest that there has been supplied to the animal having flatter lenses a movement of the eyes so as to bring objects in focus through the optical axis and overcome the distortion that would come from the oblique rays.

The normal movement of the eyes in the human family is from extreme convergence to parallelism, and to this is added in the lower animals many other movements, such as turning the eyes upward or downward. The periophthalmus and boleophthalmus are able to advance their eyes from their orbits. The mole has this power, but to a lesser degree, although it remains for the elephant, bison, and several other mammals to rotate their eyes from parallelism through an arc of 165 degrees, enabling them to see in front, behind, and laterally, without head rotation; that is, they are capable of changing from binocular to monocular vision without confusion, a protection afforded them by nature which we do not possess.

This voluntary control of the ocular muscles seen in the mammals below the simiæ was no doubt normal in primitive man before he developed a macula by concentrating his eyes at the near point, for a field of vision greater than 180 degrees was as essential to him as to the animal. Synchronous with the development of the maculas was the increased power of convergence and a diminished pupillary width. Following this was the lost



Fig. 9.



Fig. 10.



Fig. 11.

is more sensitive than the periphery; this becomes more pronounced in the carnivora, the maculas are well defined in the simiæ, and have the highest development in man.

Man's greatest lateral field of vision, for the two eyes,

power of divergence. Even today we find many of these rudimentary conditions of the eye existing. In the lowest human type we find the greatest interpupillary width and retinas having poorly-developed maculas, but rarely do we see human eyes which belong to that period of

development represented by the ungulates. So far as I know the following is the only case on record :

Mr. X., who is 32 years of age, has had the control to be described of his ocular muscles since birth. May 21, 1905, he came to me for relief of symptoms caused by astigmatism. At this time he was able to see 20/20 with each eye separately and without glasses; but by using both eyes his vision decreased to only 20/200 (Fig. 1). At first I was inclined to think there was binocular fixation without binocular vision, and that one visual field overlapped the other, causing a decreased amount of vision; but I found that by using different colored lenses over each eye he perceived a complementary color. It was also proved by other methods that he not only had binocular fixation, but also binocular vision, and that the decreased vision when using the eyes this way was due to a nonuse of the binocular position. So perfect a control has Mr. X. over his ocular muscles that it is possible for him to fix with both eyes, to turn either one out slowly and back again to double fixation without disturbance while reading. He is also able to converge both eyes (even more than the photograph shows, Fig. 2) and move his eyes simultaneously to extreme divergence as in Fig. 3. Besides this, he can move them both to the extreme right, or to the extreme left, as shown in Figs. 4 and 5, or, by holding one in any position, from extreme divergence to extreme convergence look at the side of his nose with the other as in Fig. 6. At no time since birth did Mr. X. have double vision, and it is not produced even by the use of strong prisms. His normal ocular positions are shown in Figs. 7 and 8, for he finds that monocular vision is more restful than binocular vision, because of less head rotation. In each of these positions he has both eyes in focus, seeing with the one in front and the other at the side. When he told me it was possible for him to do this I did not believe him and told him so; then while he was reading the test-card with his left eye I distorted my face in such a position that he was able to see me only with his right eye. I was surprised to hear him say "you can't come that on me."

Subsequent to sending this case to *American Medicine* for publication I was consulted by Mr. Z., aged 60, for headaches and blurring at the near-point. Upon examining the eyes I was greatly surprised to find that his muscular control equaled that of Mr. X's. At this time Mr. Z's monocular vision enabled him to read the three-quarter line without glasses and his binocular vision was a trifle better than a fifth of normal. The correction of compound myopic astigmatism in both of these cases gave normal vision in each eye separately and increased Mr. X's binocular vision to a fifth of normal the same as Mr. Z.

Although Mr. Z. dates his present condition from birth, he has never had double vision. When a young man, so as to improve his appearance, he kept his eyes in a parallel position when at public gatherings, but when working his eyes were allowed to diverge so he could read proof and set type at the same time without head rotation, a fact which I verified.

The lateral field of vision for both patients when the

eyes are diverged is 220°. Their retinas show a similarity to the ungulates in not having a highly developed area which would suggest a macula; although light perception is more acute centrally, it is nevertheless seen in all other parts of the retina.

Unfortunately, Mr. Z. is not a resident of Buffalo, for when it is too late I notice that the photographer has not caught the eyes in the best positions. Although Mr. Z's muscular control equals Mr. X's in every way, I failed to get a picture of convergence or a good one of divergence, notwithstanding that he can diverge his eyes even more than Mr. X. in Fig. 3. Fig. 9 shows the eyes parallel, that is as near as the camera caught them. His normal positions are Figs. 10 and 11, because he finds this more restful and receives a greater field of vision with less head rotation.

In conclusion, I would say if it were possible to have a pathologic examination of these eyes we would find their movements due to the absence of the macula, which would in turn prove that the macula is necessary, but only for binocular vision at the near-point.

THE RECOGNITION OF AND IMPORTANCE OF DIAGNOSIS IN INCIPIENT PULMONARY TUBERCULOSIS.¹

BY

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Pulmonary tuberculosis in man may run its course in a short time, or on the other hand, may be prolonged over many years, progressing slowly at times, again advancing rapidly, with periods of almost complete arrest. According to the various pathologic conditions existing, or according to the symptoms, or both, various terms have been used by writers to indicate the stages in the process.

In my own work I have found most useful the classification adopted by Trudeau of incipient, advanced, far advanced; incipient pulmonary tuberculosis being defined as "cases in which both the physical and rational signs point to but slight local and constitutional involvement;" advanced as "cases in which the localized disease process is either extensive or in an advanced stage, or in which with a comparatively slight amount of pulmonary involvement the rational signs point to grave constitutional impairment or to some complication;" far advanced as "cases in which both the rational and physical signs warrant the term."

The term incipient cannot include cases in which the whole of a lobe is involved or even cases with marked impairment in the apices only, when both sides are affected. Cavity formation, made apparent by physical examination, is an advanced stage in the process, and if present the case is past the incipient stage.

¹ Read before the Wayne County Medical Society, Detroit, Mich., January 8, 1906.

² Since writing this, the Committee on Nomenclature of the National Association for the Prevention and Study of Tuberculosis have recommended the use of the terms incipient, moderately advanced, advanced, and acute miliary. It is to be hoped that these will be adopted generally.

In this classification bacilli may or may not be present in the sputum. To be accurate we should not describe a case as incipient when bacilli are found, for their presence indicates that there has been invasion, formation of tubercles, and caseation, with an opening from the caseous center into a bronchus or bronchiole, *i. e.*, the formation of a very small cavity. With constant improvement in our methods of physical examination it cannot be long before the term incipient will be restricted to the diagnosis of tuberculosis before the appearance of the bacilli in the sputum, and it should be our endeavor to make the diagnosis absolute in any case coming to our notice without waiting for the presence of bacilli to make certain the condition.

The great importance of an early diagnosis lies in the prognosis. In the reports¹ of nearly 1,000 cases under treatment in the Muskoka Cottage Sanatorium I have been able to show that of the incipient cases 75% or over may be apparently cured, while of the advanced cases less than 15% may be expected to make a full recovery and of far advanced cases less than 1%. How necessary then that we use every means at our command to assist us in our diagnosis in all suspected cases, particularly in those reared in tuberculous families, or those in workshops or offices who have been exposed to infection.

Many cases of tuberculosis first come to the notice of the physician when they are advanced cases. The patient has been "run down," has had a cold for five or six weeks which has "settled on his chest" and which he "cannot shake off" as he has done previous colds. Too often the physician on examination finds marked impairment of resonance with roughened breathing and moist rales, while the sputum if examined shows bacilli in large quantities. Too often, unfortunately, the sputum is not examined. The patient is told that his lungs are weak but that he will readily shake off his cold. The patient keeps on at his work and the bacillus keeps on at his, so that when the patient is examined again in from one to six months, when symptoms are more pronounced, the physician finds conditions changed and is at once alarmed. The patient is now made aware of the nature of his disease and some active steps are taken either for treatment at home, in some sanatorium, or he is sent away for climatic change.

In many cases there is difficulty in making a diagnosis, in others the physician fears the result should he speak freely to his patient, particularly if the home surroundings are not satisfactory and he knows that it is out of the question for the patient to get away, or the symptoms may be so slight that he does not wish to alarm his patient.

There are, however, comparatively few cases in which there is difficulty in making the diagnosis, if care be taken to group carefully the facts elicited by previous history, present symptoms and physical examination.

Cases such as the following are not at all uncommon:

One morning when dressing the patient coughed up a mouthful of blood. There followed some hoarseness and weakness of voice and he went to a laryngologist for examination. No cause could be found in the throat or

nose. The chest was examined by his physician, who reported negatively. Within two weeks there was a recurrence, larynx and chest were again examined and reported perfect except for a slight catarrhal condition of the mucous membrane of the larynx. His mother had died of pulmonary tuberculosis and one sister was at the time under sanatorium treatment for the same disease. She insisted on the tuberculin test being used and it was then that the patient came under my observation. There was no difficulty in discovering a slight retraction, lessened expansion, impairment of resonance and prolongation of expiration in the right apex. With the exception of the last all were slight, but all were present. The patient said he had had no sputum whatever, though there was a slight cough. Examination of the larynx showed only a slight reddening of the mucous membrane, but some distance below the glottis on the tracheal wall there was a small flake of mucus. By coughing, this was expelled and careful examination revealed a few bacilli. Here, then, was a patient assured that he was free of tuberculosis who presented slight but definite physical signs and gave history of cough, hoarseness, and hemoptysis with family history of the disease. Thinking he had no sputum, the fallacy probably was no bacilli, therefore no tuberculosis present.

A short time away from his office, under careful supervision, and he was able to return to his work. Had he remained at his desk till moist rales appeared and there was free morning sputum containing bacilli, the few months he took to become well would have necessarily been years, with perhaps an uncertain result.

In any case in which there is a suspicion of tuberculosis, repeated examinations of the sputum (if there be any) may be necessary, and at least 15 or 20 examinations should be made before being satisfied of the absence of bacilli. If not found, the inoculation of a guineapig will often demonstrate their presence, and this same method should be made use of in determining whether the sputum in an arrested case is free of bacilli. When repeated microscopic examination fails to show their presence, animal inoculation will often demonstrate them. Do not waste time in examining five or six slides of any one specimen. Remember Hill's results. He found bacilli in only about 1% of second slides when first slide from same sputum was negative.

We must not forget that there may be extensive physical signs with the sputum perfectly free of bacilli, that the patient may have advanced, or even far advanced disease with negative sputum, while on the other hand there may be slight sputum containing bacilli with no discoverable physical signs of disease. It follows that an examination of the sputum should be made in all cases in which there is cough extending over any length of time, and that in any suspicious case in which the sputum examination is negative, we must not rest content but endeavor to establish the diagnosis by other means at our command, and we should ever endeavor to establish the diagnosis at the earliest moment possible, for a delay of months or even weeks may be sufficient to destroy our patient's prospects of recovery.

The examination of the patient will naturally begin with a statement of the symptoms for which he presents himself, and with this a careful inquiry into his previous history, both as to any illness and as to his habits, occupation, and surroundings. The family history is also to be inquired into. His previous history may shed a great

¹ Annual Reports of Muskoka Cottage Sanatorium, 1902, 1903, and 1904.

deal of light on the case, and thoroughness in this part of the inquiry will be well repaid.

The occurrence of hemoptysis is always suggestive of pulmonary tuberculosis, and if occurring in a person with any slight physical signs is sufficient to warrant a diagnosis if a thorough examination excludes evidence of the origin of the blood from the upper part of the respiratory tract. We are not justified in saying that in all cases of hemoptysis there is underlying disease of the lung. There are occasional cases which at no subsequent period develop symptoms or physical signs of pulmonary tuberculosis, but these cases are few, and the recurrence of hemoptysis without definite signs always demands thorough and painstaking observation, while if there should be an accompanying rise in temperature which persists, or a history of previous recurring attacks of slight fever, the condition is fairly evident. If no other diagnosis can be made, the patient should be considered to have pulmonary tuberculosis and be treated accordingly.

The clinical features of pulmonary tuberculosis are varied, and the groupings of symptoms differ, as a rule, markedly in every patient, and will, of course, present a different picture, according as we are dealing with an active early case, say in the stage of invasion, or a quiescent early case with tubercles formed and well walled off, or caseating with free drainage into some division of the bronchus.

Cough is present, as a rule, but may be absent. When absent we must watch for a clearing of the throat, or question closely whether he clears "phlegm" from the throat in the mornings. This will often be found when the patient says he never coughs, or there may be a slight cough present of which the patient is quite unconscious. He may cough frequently through the day without being aware of it. Dyspnea is scarcely present in early tuberculosis.

There is usually some acceleration of the pulse, but this will in a great measure depend on whether the disease is active or quiescent, and is more marked when there is much debility present. With the increase in rate there will generally be found a lessened volume and diminished tension.

Tuberculosis being so often a disease of debility, we may naturally expect digestive disturbances, and these we find in most cases, especially if there be any rise in temperature during the stage of invasion or extension from a previous focus. The loss of appetite and inability to digest food may be due either to the pyrexia and toxemia, or to the anemia so often present, all helping to make up the general picture of debility and ill-health of which the patient complains. Again, the debility is not marked, but may be gradually increasing with the recurring attacks of so-called influenza, for which the patient comes to seek advice; and too often the cough following this influenza is treated as a bronchitis until the disease is so advanced that other symptoms set in, and the condition is recognized too late.

Loss in weight, gradually progressive, with no apparent reason, particularly in a young person, at once suggests tuberculosis. There may be no cough present. A cough with slight hoarseness in a person with debility,

anemia or slight evening rise of temperature is also suggestive.

Systematic observations of temperature should be followed in all suspicious cases. A daily rise in temperature, even if only 99° to 99.5°, with some loss in weight and slight physical signs in the chest, is sufficient to warrant a diagnosis. Two or four-hourly observations to begin with, and if it is found that there is a maximum at a certain period of the day, the temperature should then be regularly taken at this time. Do not forget that on a cold day the temperature taken by the mouth is rarely registered accurately if the patient has just come into the office. On a cold day the observation should not be made until the patient has been inside for at least half an hour, or if taken soon after coming in, the thermometer should be left in the mouth long beyond its certified time—say 15 to 20 minutes—with the lips closed. If it is not found elevated and you are still suspicious of the existence of tuberculosis, take the temperature after exercise. With exercise the temperature of the tuberculous person will rise higher than that of the healthy man. Temperature observations in early cases should extend over many days.

Night-sweats are more generally found in advanced disease with mixed infection, but are occasionally present during extension of the disease when the area involved is yet small. Physical examination of the chest may or may not afford valuable information. At the onset the lesion is not large enough to produce any abnormal physical signs. As the disease extends or the inflammatory reaction about the tubercles increases definite physical signs appear, and it should be our endeavor to discover them at the earliest possible moment. The more skilled or the better trained the observer, the earlier will he be able to make his diagnosis. As one in seven of our population in Canada and the United States dies of tuberculosis, and it is estimated that one in four or five has at some time a tuberculous invasion, it is incumbent on the physician to be well skilled in physical diagnosis.

It scarcely seems necessary for me to make any remarks on the physical signs of early tuberculosis. With these all are conversant. Always bear in mind that the earlier the disease the less we find abnormal on physical examination, and the absence of physical signs does not of itself allow us to exclude the presence of the disease.

I find that a piano stool is the most useful examining seat, for on it the patient may be readily turned about. The patient should be examined where there is a good light and the whole chest made bare, from shoulder to costal margins. No one can make a thorough examination of the chest with a part of it covered with under-clothing and hurry should be no excuse.

In case of much deposit or adhesions at the apex, inspection and palpation will give valuable information and this part of the examination is not to be overlooked. Standing behind the patient with the hands on either apex anteriorly the comparative excursions of the sides are readily noted, and even when there seems to be little difference in the amount of expansion, the hand may often detect a lagging behind of the affected side during both inspiration and expiration, due to the loss of elasticity.

A retraction above and below the clavicle is noticeable in some patients, principally those who give a history of invasion some years previously and in whom there has been subsequent contraction of lung tissue, a slow process which may have come on unnoticed. It is not unusual to find a patient with signs of recent disease in such an apex, the old lesion having been present for many years possibly.

Percussion will reveal very little in the early stage, but as the disease progresses changes in resonance become noticeable. Auscultatory signs, too, will generally be absent at first, and their later appearance will to some extent depend upon the depth at which the lesion is situated. Crepitant sounds, persistent crackles or small moist rales are to be looked for. It may be necessary to ask the patient to cough in order to elicit them. The respiratory murmur will be increased or diminished, dependent upon the distance of the deposit from the surface and the presence or absence of pleural thickening.

When the physical examination of the chest is insufficient to make a diagnosis, a search must be made for evidences of tuberculous invasion elsewhere in the body, ischiorectal abscess, joint or bone involvement, enlarged cervical or axillary glands or other tissues or organs.

The fluoroscope offers another method of diagnosis, and though I do not feel we should make a diagnosis on its findings alone, taken in conjunction with auscultation, palpation, and other methods of physical examination, it affords valuable information, which may be of material assistance in some difficult cases.

When all these methods have failed we may have recourse to the tuberculin test. The experience of those who have used it extensively has shown that its administration is fraught with no danger to the patient, while in only rare cases is the reaction absent. We know it is often absent when used in advanced cases, but in such cases there is no reason for its use, as the diagnosis is evident without it. It is to be used only in apyretic cases, in doses of from $\frac{1}{2}$ mg. to 2 mg., depending upon the general condition of the patient, making 2 mg. the maximum initial dose for a large sthenic man. If no reaction follows, then in three to seven days give an increased amount, 2 mg. for a child, up to 5 mg. or 6 mg. for a robust adult. A third injection should be given after another interval, if necessary. The patient should, of course, be at rest the day previous to the administrations of the tuberculin, and the temperature carefully recorded, and he should remain in bed until the reaction has passed off—an interval of one to two days.

The results of examination should all be carefully recorded. The unassisted memory is often at fault, and unless a thorough examination is properly recorded, its greatest value is lost—that is, the comparison with subsequent findings. For my own work I have adopted a system of symbols which, superimposed upon a diagram of the chest, show at a glance the conditions existing and save time not only in recording but in later comparisons when a glance recalls the former findings. This I have described elsewhere.¹

My remarks have been directed rather more to the

importance of an early diagnosis than to the means employed. The latter may be learned from textbooks and from diligent practice. They have been learned by you all, but coming in contact continually with patients having advanced tuberculosis who have drifted into that condition while in the hands of their physician, I feel the necessity for making an appeal to the profession to be more careful in the examination of those coming for advice for coughs, colds, debility, indigestion, anemia, and the host of symptoms which may be the results, not the forerunners of pulmonary tuberculosis.

The medical profession has ever been bearing the banner of progress in sanitary science and the prophylaxis of disease; next in importance to the control of the spread of this disease by the destruction of all expectorated matter, and the prevention of indiscriminate spitting, is the early recognition of the disease, and though the public may be educated to some extent to help in this, the greater part of the responsibility will ever rest upon the physician, and especially the family physician. I sincerely trust that all here present will do everything in their power to assist in stamping out this disease which entails such an enormous financial loss to our nations each year and brings distress, want and sorrow into so many of our homes.

THE ETIOLOGY OF THE HEMORRHAGIC DIATHESIS.¹

BY

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The subject of the etiology of the hemorrhagic diathesis is one that has engaged the attention of some of the most learned men in the profession. That it is a question of great scientific importance is attested by the abundance of literature upon the subject, and that it is one of great practical importance, especially to the nose and throat surgeon, is well substantiated by the number of cases reported of serious or fatal hemorrhages after slight operations in this region. The nature of this condition has developed any number of hypotheses upon which to explain its cause.

The subject may be conveniently treated from two etiologic points of view: (1) In a broader sense as an acquired transient condition; and (2) from a more restricted view, as a hereditary, habitual affection, commonly known as hemophilia.

My definition of the acquired hemorrhagic diathesis is that it is a temporary tendency to bleed, and is usually developed secondary to some disease or condition in which there is a marked disturbance in the physiologic relations between the blood and the walls of the vessels. Clinically it is this form of the dyscrasia which we most frequently meet, and it is within the province of this paper to consider some of the causes that may lead to this condition.

My classification is as follows: 1. Infectious diseases and toxic conditions as etiologic factors. 2. Cachectic

¹ Ched Examinations, a system of recording observations: Canadian Jour. Med. and Surgery, November, 1904.

¹ Abstract of a paper read before the Society of Alumni of Bellevue Hospital.

conditions. 3. *Purpura hæmorrhagica*. 4. Hemophilia. A transient hæmorrhagic condition is sometimes developed in the severe types of the acute infectious diseases, as in variola, measles, typhus fever, infectious diseases of the newborn, etc. Here it is symptomatic and is due to the chemical action of the toxins on the walls of the vessels and to their poorly nourished condition. The hemorrhages are petechial in character and can scarcely be considered more than indicative of a very intense degree of infection. Last September I observed a case which to my mind illustrated this condition perfectly.

The patient, a boy aged 9, had passed through the acute stages of an attack of lobar pneumonia, involving the middle and lower lobes of the right lung. I first saw him near the end of the second week that he became ill. The patient presented a typhoid appearance, and, according to the history, about 24 hours before I saw him, he had suddenly developed an acute hemorrhagic tendency. I had the patient under observation for 10 hours, during which time he had three or four profuse hemorrhages from the nose, and finally died in an almost exsanguinated condition. Other evidences of this hemorrhagic tendency were a few petechial spots on the legs. The stools were of the color and consistency of tar, evidently being principally composed of blood that had passed through the intestinal tract. The blood from the nose was very dark, and on examining it with the microscope many of the blood cells were found to be disintegrated. No plasmodia were found.

The case seemed to be one in which the hemorrhagic diathesis had been developed by the intense toxemia accompanying the pneumonia.

Malaria is one of the most important causes of the hemorrhagic diathesis. The tendency to bleed is caused by the destructive influence of the plasmodium upon the blood cells, thus changing the physiologic relation between the blood and the walls of the vessels. This occurs principally in the severer types of the disease, but it is probably common as a hematuria or hemoglobinuria in the very chronic forms so frequent in some parts of the South. About three years ago, while in an intensely malarial district in the South, I had an opportunity to observe four subjects of typical malarial cachexia. They were all children, members of the same family, and ranging in age from 9 to 16. They had been born under intensely miasmatic conditions and probably had never been free from malaria a day in their lives. The skin of these children was of a deep saffron hue, their livers were slightly enlarged, and their spleens were enormously enlarged. In one of them it reached to the ilium. I made a microscopic examination of the blood and urine and found the plasmodium in only one of the cases, but nearly all of the leukocytes contained pigment. In the urine of all four patients I found blood cells, pigment, and all the cellular elements deeply stained, showing that the hemorrhagic tendency was developed in these patients and was manifesting itself continuously as a hematuria and hemoglobinuria. These children all suffered with occasional severe attacks of epistaxis.

I have been unable to find very much in the literature upon the transient hemorrhagic diathesis developed in chronic malaria, but from my experience in these cases and in others I am inclined to believe that it is much more frequent than is generally supposed.

If, therefore, we are considering an operation, especially upon the nose or throat of a patient giving a recent history of malaria, we should anticipate trouble by administering a prolonged course of quinin prior to attempting it.

Often cases are presented in which an operation is considered necessary, but we are in doubt as to its safety, because of a vague history of previous prolonged attacks of epistaxis or inordinate hemorrhage from slight injuries, and yet we are satisfied from the absence of hereditary history that there is no taint of hemophilia; we have also excluded malaria and other cachectic conditions. Under such circumstances, I believe that the precaution should be observed of administering for a few days prior to the operation one of the salts of calcium, preferably the chlorid, as this has been proved by Prof. Wright to exert a distinct influence in diminishing the coagulation time of the blood. This salt is soluble in 1.5 parts of water, and should be given in 2 gm. doses twice a day. Its continued use, however, should be interrupted every three days by an interval of 24 hours, for it has been discovered that in saturated solution in the blood the coagulation time of the latter is increased rather than diminished.

In *cachectic conditions* such as pernicious anemia, leukemia, scurvy, chronic nephritis, syphilis, and in diseases of the liver in which there is an accumulation of bile in the blood, the hemorrhagic diathesis is sometimes developed.

There is also a tendency to bleed sometimes developed from *mechanical defects* in the circulation, as in valvular disease of the heart, and senile purpura, which is due to atheroma of the vessels and retarded circulation.

Certain *toxic agents* by their chemical action upon the blood and the vessel walls are capable of inducing the hemorrhagic diathesis. Among these are such drugs as phosphorus, mercury, chloroform, antipyrin and a multitude of others.

Purpura hæmorrhagica forms the connecting link between the symptomatic hemorrhagic diathesis, and the pure type of the hemorrhagic diathesis, or hemophilia. This disease cannot properly be classed under the head of hemophilia, because it is lacking in the essential characteristics of this affection. It is transient and is not hereditary. It differs from the ordinary symptomatic hemorrhagic diathesis in that it has the characters of an independent affection, not being dependent for its foundation on some primary disease. It may occur at any period of life in males and females alike. It is said to be apt to recur from time to time in people who have once been affected; the cause of this predisposition is not understood; but since these subjects are free from any hemorrhagic tendency in the intervals between the attacks, and since there is no history of heredity, they cannot be considered as due to hemophilia.

Purpura hæmorrhagica occurs in convalescents from all sorts of severe diseases. Here it is not symptomatic, because the original disease has been cured. The cause is said to be that the bloodvessels do not recover their healthy tone and strength as rapidly as the heart under the stimulation of returning physical activity. The cause

of purpura hæmorrhagica is unknown; indeed it has been said that the less we can discover concerning the etiology of a case of transient hemorrhagic diathesis the greater the probability that it belongs to the category of morbus maculosus. And now we come to the domain of hypotheses, and will consider as Grandidier termed it that "most hereditary of all hereditary diseases," that enigma of pathology, hemophilia, a disease that stands as a menace to every surgeon, and especially the nose and throat operator, for it is from this region that the fatal hemorrhage frequently occurs. In over 50 % of a series of 334 cases collected by Grandidier, the chief bleedings occurred from the nose.

The affection was first mentioned by an Arabian physician who died in 1107. He characterized it as being "something monstrous," and no doubt modern physicians will agree with him. During the following 600 years no mention whatever was made of hemophilia. In 1820 Nasse wrote a very complete article entitled "An Hereditary Disposition to Fatal Hemorrhage." Others who have given the subject special attention are Virchow, Grandidier, Legg, Lange, and Wachsmuth. None of the theories that has been advanced has been exclusively accepted, and the cause of this disease still belongs to the obscure problems of pathology. Hemophilia does not seem to be a disease having a definite pathologic character, but rather an original structural defect in the constitution, possibly dependent upon some undiscoverable abnormality in the original cell from which the organism was developed.

The great predisposing element in this disease is, as intimated before, heredity. Grandidier found 512 cases in 174 families, an average of about three cases to the family, and this is about the proportion mentioned by other writers.

The manner of transmission in this disease is characteristic; it passes from mother to son, and almost never from father to son, although it is true that few males in bleeder families reach the procreative age. In considering this phenomenon we must assume, not that the disease has skipped the mother and that she is healthy, but rather that it is rendered latent in her by the peculiarities of her sexual nature. Indeed, in woman, seems to lie the *fons et origo mali*.

The proportion of males to females affected is about 13 to 1. The Anglo-Germanic and Jewish races seem to be predisposed to the disease, and it is thought by some that this is due to the greater frequency of consanguineous marriages among these people. This affection usually develops during the early months of life, and no case is on record when the first manifestations appeared later than the twenty-second year. The exciting cause of the hemorrhage is usually some slight traumatism, though it may be spontaneous in any part of the body, and especially into the joints and from the nose. Slight contusions and abrasions seem more apt to produce dangerous hemorrhage than more extensive injuries. This is particularly true concerning injuries to the nose. Vaccination seems to be an exception to this rule, as this operation upon a bleeder has never been known to be followed by hemorrhage.

In seeking the cause of hemophilia from an anatomic

point of view we must consider first the vascular system, which Virchow says is abnormally affected more uniformly than any apparatus in the body. Both older and more recent writers speak of the striking superficiality and abnormal distribution of the cutaneous and subcutaneous veins and arteries. The intima in the smaller and larger arteries was found thin and sometimes transparent in a large series of cases. The lumens of the larger vessels and their branches have been found abnormally narrow and sometimes the vessel walls have been found to have undergone partial fatty degeneration similar to that occasionally found in anemia and chlorosis.

Vascular plethora, produced because of a disproportion between the amount of blood and the vascular accommodation, and this augmented by a cardiac hypertrophy very frequently found in this disease, has been supposed to be an etiologic factor. Senator thought that the pathologic changes were more likely to be in the bloodvessels than in the blood itself, because of the occasional occurrence of cases in which the manifestations are entirely local, as in a case described by himself in which the blood came from the kidney, and another by Osler in which the bleedings occurred only from cuts above the neck.

There have been many contradictory statements made as to the condition of the blood in this disease, but recent writers declare that the blood is normal as to coagulability and very rich in blood cells.

Some have claimed the cause of hemophilia to be deficient enervation of the vessel walls. This is plainly an attempt to beg the question, as it is very evident that no sensible conclusion can be reached from any such vague assumption.

But of all attempts at explaining the cause that one is weakest which would make hemophilia identical with some equally obscure affection, such as rheumatism.

I have endeavored to give in as concise a manner as possible the principal theories advanced to explain the cause of this protean disease and to draw from these the consensus of opinion upon this subject up to the present time; but in conclusion, I would emphasize that after all it is merely opinion, and is founded upon hypotheses that cannot be proved to be correct.

Health conditions on the Isthmus are excellent. During January there were 22,000 employes on the rolls. The average daily number of sick was 503, or 22 per 1,000. Among the employes 74 deaths occurred, including 26 from pneumonia, principally among negroes. There was no quarantinable disease on the Isthmus February 16. The last case of yellow fever at Colon was reported December 11; the last case at Panama, November 11.

Municipal Milk Depots and Milk Sterilization.—G. F. McCleary (Jour. Royal San. Inst., London, 1905, Vol. xxvi, 224-239) concluded that each municipality should, by establishing its own dairies, provide pure, clean milk; that municipal milk should not be sterilized milk. Municipal milk should be supplied primarily to these classes of milk consumers: Nursing mothers; children over nine months; infants under nine months for whom breast feeding is impossible.

NOSE AND THROAT DISEASES FROM A CONSTITUTIONAL STANDPOINT.¹

BY

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In this paper I will endeavor to show the interrelation of diseases that come under the control of the general practitioner, and those of the nose and throat specialist. Not only do I wish to show that diseases of the nose and throat cause general systemic disturbances, but also that certain diseased conditions of other organs of the body cause nasal, pharyngeal, and laryngeal disturbances.

In these days of specialists we are apt to become not only narrow-minded in our views, but also inclined to devote our time and studies to our one accepted branch, to the almost total exclusion of the other branches. Because a man wishes to become a gynecologist is no reason for his overlooking rhinology and laryngology, and *vice versa*, as I shall show later. And what sort of a specialist does a man make who neglects to study, or neglects to keep on studying, general medicine, therapeutics—yes, and physiology and hygiene? How can a man treat a diseased membrane intelligently if he does not know what drugs are eliminated through a certain membrane, or does not know what hygienic measures to prescribe or what diet to give?

To my mind a specialist is one who is a good practitioner, who has spent time—yes, and as in our college days used midnight oil thoroughly to perfect himself in the knowledge of a certain organ of the body, its physiology, its structure, its uses and abuses, the methods used in the treatment and cure of that organ's ailments, and in trying to better these methods.

The fact that there is an intimate relation between the nasopharyngeal membranes and the different organs of the body is becoming so well recognized that we cannot pass over it lightly, and in many cases a diagnosis, if not cleared up immediately, can be led up to by some fact learned in an expert examination of the upper respiratory tract. For instance, a patient comes into the office of a physician complaining of stomach trouble. You give him correctives, you give him digestants, regulate his hygiene and his diet. He complains of headache, which perhaps you attribute to the stomach trouble or constipation. The method pursued relieves the stomach symptoms but temporarily, while the headache still continues, and the patient after a while goes to another physician; or the patient, maybe having an acute coryza, goes to a rhinologist, and here it is discovered that he has a suppurating frontal sinusitis. Is it not very possible that involuntarily, perhaps at night, he swallows some of this discharge from the sinus, and in consequence the stomach is being continually irritated in this way, and when the opening from the frontal sinus becomes occluded and the discharge of pus ceases, the stomach symptoms are relieved, but the headache becomes worse?

Headache may also occur from frontal sinus disease without suppuration; Charles M. Robertson, of Chicago, says there may be a diminution of air-pressure in the sinus due to an occlusion of its natural orifice. The oxygen is removed from the air and the pressure on the mucous membrane is so lessened by rarefaction that the membrane swells, and if the opening remains closed the cavity is encroached upon by: (1) The swelling mucous membrane; (2) the outpouring of lymph; and (3) the engorgement of the mucous membrane by the lymph, resulting in a dull, and maybe severe headache, which otherwise cannot be accounted for. In these cases transillumination shows nothing, but a history of previous short attacks is very important.

Again, Dr. Lewis A. Coffin quotes Hemmeter as saying that he has seen a case of postnasal catarrh disappear when a decided hyperacidity of the stomach had been corrected. Dr. Coffin goes on to state that in his opinion indigestion is the cause of nasopharyngitis and adenoids, as the normal chyme eructated is a source of continual irritation to the nasopharyngeal membrane. But there may not always be eructations of chyme to cause the irritation. Last summer I operated on a thin anemic boy for adenoids. He was a sufferer from indigestion, complaining of a bloated feeling after eating, slight belching of gas, and constipation, beside his mouth-breathing, on account of which he was sent to me. I found the nasopharynx blocked by adenoids, which I removed. I saw the boy about a month afterward and found that without any treatment the indigestion had disappeared and he was steadily gaining in weight. This case may also be an illustration of what Dr. George Fetterolf speaks in his article on "Reflex Cardiac Inhibition Resulting from Operation on Frontal Sinus," showing the intimate connection under chloroform anesthesia between the fifth and tenth cranial nerves. Normally the relations between the nuclei of the fifth and tenth cranial nerves are controlled by centers higher up and are not interfered with by ether, but chloroform gives free play between the connecting fibers, and as a consequence, any irritation of the trigeminus may produce, through the cardioinhibitory branches of the vagus, interference with or stoppage of the heart action, this applying to adenoids as well as the frontal sinus. My patient's heart apparently stopped completely, and it was only after prolonged effort that I brought him around, and before he was entirely conscious I completed the operation with only a slight slowing of the heart's action.

Again consider rheumatism and its relations to the upper respiratory tract. There are a number of patients who complain of sore spots along the nasal membrane which can be relieved locally for only a very short time, but put them on the salicylates and they get well promptly. A case of acute laryngeal edema and infiltration during an acute attack of rheumatism is also reported. Taking that form of uric acid diathesis known as lithemia, in which there is no excess of uric acid in the urine, there are none of the usual constitutional symptoms, but the product of nitrogenous metabolism is retained in the system. This will show in the pharyngeal and laryn-

¹ Read before the Northwest Medical Society, Philadelphia, November 6, 1905.

geal membranes, their engorged bloodvessels, hypersecretion, membranes covered with tenacious mucus, and other symptoms being caused by the effort of the membranes to excrete this excess not thrown off by the kidneys. J. A. Stucky, of Lexington, notes this, but especially emphasizes the excess of indican in the urine, and says it occurs in neurotics and "good liver" who do more mental than physical work. These patients are frequently "taking cold," sneezing; they complain of stuffiness and frequent copious discharges from the nose, and always come saying: "I have catarrh." In a patient of my own who complained of laryngeal soreness, dryness, dropping of mucus from the nasopharynx and attacks of tonsillitis, I apparently could not find any cause until I examined the heart and found incompetence of the mitral valves. This condition I treated and in a comparatively short time the patient was apparently normal, the trouble being more than probably due to the backing up of the blood throughout the system on account of this mitral incompetence.

Let us now look at the other side of the picture, that of bodily disease caused by disease or malformation in the upper respiratory tract. O. B. Douglas, of Concord, N. H., writing on "Reflex Disturbances Referable to Nasal Obstruction," refers to Dr. Jacobi's statement in the New York Academy of Medicine that "he has seen at least a dozen cases of chorea which had no other cause than chronic nasopharyngeal catarrh, deviated system, ozena, etc.," and Dr. Baruch said on the same occasion: "The first positive case which removed my scepticism on the reflex influence of nasal peripheral irritation was a cure in a case of epilepsy."

H. Bellamy Gardner, of London, in examining for the army, took note of the fact that many men who had varicose veins of the legs had also enlarged tonsils. He also found that in anesthetizing by the closed method, patients who were of a florid, full-necked, healthy type suffered from cyanosis, labored breathing, and excessive mucus secretion, due to the reduction of the ingress of the air by the enlarged tonsils. He says: "My belief is that the chronic obstructions to free respiration and oxidation of the blood from which these patients suffer produces a certain degree of chronic engorgement throughout the systemic veins, and that this factor (that is, the enlarged tonsils) contributes to the gradual dilation of the veins in the legs from which these patients suffer." Gardner also speaks of enlarged tonsils being a factor in hernia by causing forced breathing and abdominal exertion, this being obvious in watching a child with enlarged tonsils asleep in a supine position (F. T. Nye, Milwaukee). In septal deflections, especially those that are obstructive in character, the sequels are many and far reaching. The imperfect respiratory function results in phonatory or olfactory disturbances such as pharyngitis or laryngitis, and is especially serious in children with adenoids, preventing their normal healthy development. The adenoids, aside from digestive disturbances caused by the swallowing of the discharges and accumulated mucus, cause the bad habit of mouth-breathing and also interfere with the feeding of infants. Many a mother has told the doctor that her baby regurgitates the milk,

or else does not swallow it; or in the case of a careless mother not noticing these conditions, the physician observing the baby's loss of weight, thinks the milk, mother's or bottle, is poor, when if an examination be made, adenoids will probably be found, blocking the nasopharynx so that the baby cannot swallow unless it gulps down a lot of air, and practically starves. I know of one baby whose condition was as stated, who was operated upon and adenoids removed at seven weeks, and there was no further trouble.

In the cases of septal deviation and obstruction with its accompanying pharyngitis (A. Freudenthal, N. Y.), the normal current of air is disturbed, the diseased membrane becomes a resting-place for bacteria which escape the anterior nares and a medium of absorption for bacterial toxins, and in persons susceptible to tuberculosis induces that disease by the tubercle bacillus entering the lymph channels through the membrane. These dry atrophic conditions of the nasopharynx are especially noticeable in spring and summer after a winter of living in dry, overheated rooms, and the consequent quick changes of temperature on leaving and entering the house.

The deflected septum may be a cause of headache in a number of cases from either an occlusion of the ducts and thus setting up a sinusitis, or else from pressure on the turbinate bodies, these headaches often being attributed to other causes or diagnosed as migraine or neuralgia (W. B. Hidden, Boston; Oscar Wilkinson, Washington, D. C.). The presence of disease in the nasal membrane is not only discomforting to the patient in that his appetite and digestion are impaired by the odor, or swallowing of discharges, but owing to its proximity to the brain, being only separated by a thin partition of bone, it unfits the acute sufferer for mental work and is the cause of many a "run-down system," or "nervous prostration;" or extending to the ear, gives rise to all sorts of strange noises in the head and at times to excruciating agony.

There is also another part of our anatomy which is in close relation to nasal conditions, and that is the genitalia. E. S. Talbot, Detroit, speaks of the investigation as begun by experiments on dogs and by observation these facts were established. For example, Cloquet calls attention to the fact that man's sexual passion is excited by the odor of flowers, and states that Richelieu lived in an atmosphere laden with perfume as a stimulus to voluptu. Sexual excitation may cause epistaxis due to turgescence of the nasal membrane during the act, as for instance, the case of a boy of 16 reported by Joel, who suffered from headache and masturbated in order to cause nose bleed and thus relieve the headache. In like manner, the influence of menstruation on the voice of public singers points still further to this close relation between the two organs (Sinexon), while many women during pregnancy complain of more or less stuffing up of the nostrils.

It has also been noticed by nose and throat specialists that overindulgence sexually, causing continued engorgement of the nasal membrane, results in relaxation of the membrane from vasomotor paralysis, which is followed by hyperplasia or atrophy. Also that after removal of

the genital organs, the nasal membrane returns to the state in which it was before puberty.

In conclusion, I would emphasize that in many instances an apparent disease or condition is nothing more than a symptom of the true cause of trouble, and it behooves us to examine our patients carefully in every particular in order that we may treat them intelligently.

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THE "KING'S EVIL" AND ITS "CURES."

BY

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The variable group of pathologic conditions connoted by the venerable popular phrase "King's Evil" seems to have loomed largely over the horizon of the folklore medicine of most of the countries of Europe. Its persistent chronicity rendered its visitations a dire calamity; the disfigurement of the most esthetic features of the body, which it was so very prone to produce, made its advent a curse to the afflicted individual; while its tendency to lead to the formation of hideous "running sores" rendered its victim an object of greater loathing than pity in the eyes of nearly every beholder. All these elements of misfortune associated with the presence of the "King's Evil" were emphasized to the utmost by the generally unsatisfactory nature of the results obtained by most of the old forms of medical treatment, and the usual avoidance of surgical intervention. And, in the opening years of the twentieth century, we find the scrofulous invasion of the lymphatic glands—especially those of the cervical region to which the name of King's Evil has for so many centuries been attached—to still constitute a focus of concentrated interest for the practising physician as well as for the general public. The scrofulous, like the poor, are always with us; and, as in the case of poverty, although we may sometimes cause a local diminution of symptoms, we do not yet seem to have reached within a measurable distance of the secret of extermination. The possession and controlled transmission of science and literature having been for many ages in a great measure perquisites of the Catholic hierarchy, it naturally followed that the members of this

body were often appealed to for the exercise of special medical skill. The victims of the diseases hopelessly chronic, or incurable by any known scientific methods, would inevitably appeal to the representatives and interpreters of the divine and miraculous powers. And the awe which pervades the atmosphere of irresponsible power gave, during the same centuries, an emotional basis for the development of the idea that "there's a divinity doth hedge a King." Accordingly, it is not after all—even in our own materialistic and democratic twentieth century—so difficult to fancy the development of marked physical results from the cheering consequences of a series of gentle and sympathetic touches of a hand which ordinarily wielded the unquestioned power of life and death! And, when informed that the divine gift of healing was conferred upon the royal hand by the sacred unction thereto applied on the day of consecration, the victim of a foul disease—perhaps also of poverty and oppression—was placed in the condition of maximum receptivity of suggestive therapeutics. This train of ideas has been elicited by the perusal of an interesting paper in the *Presse Médicale* from the pen of Professor Landouzy, who gives a historic sketch—illustrated by four engravings—of the practice of the *royal touch* treatment of scrofulous disease which was carried on for centuries by the monarchs of England and of France. The origin of the custom in either country is now obscured by distance. In England, the traditional account appears pretty uniformly to have referred its earliest adoption to Edward the Confessor; and Dr. Landouzy points out that this would mean that the English King was following a similar practice to that of the French, soon after the death of its originator, Robert, son and successor of Hugh Capet. In France, the *royal touch* was practised with great eclat by the various sovereigns down to the ill-fated Louis XVI. Napoleon, although he crowned himself Emperor, and was consecrated by the Pope in person, did not lay claim to the divine gift of healing. In this respect, he would seem to have been of the same way of thinking as the English uncrowned usurper of autocratic power, Oliver Cromwell. In England Charles II, on being restored to the throne of his fathers, reintroduced the practice of the royal gift of healing with the fullest eclat. It remained till George I, and the Pretender—who laid the most aggressive claims to it; it then disappeared from the British monarchy. The French Restoration brought in Louis XVIII, but not the practice of the royal touch. Charles X made a deplorably feeble attempt to display the personal powers invested in him by his inheritance of the divine gift. He "touched," but did not repeat the sacred ritualistic formula which had been always used by the crowned representatives of the palmy days of French monarchy: *Le Roi te touche, Dieu te guerit*. His physician, Baron Alibert, the great dermatologist of France in that day, refers to the *endemic* nature of scrof-

ulous disease, but says nothing in recognition of the divine gift of healing claimed by his royal master. What a contrast to the noisy expression of devoted faith evolved by the physicians of French royalty under the old regime! And in stolid England, too, we find the testimony of such highly respectable witnesses as John of Gaddesden, physician to Edward II, Wiseman, physician to Charles I, Turner, an eminent medical writer and author of the first great English "Herbal,"—expressing their unbounded faith in the efficacy of the royal touch in "King's Evil"—fortified by the somewhat more uncertain testimony afforded by such witnesses as Bishop Douglas, Sir Thomas Browne (whose faith in the existence of witches and of a personal devil was also unlimited), and John Brown, the author of the celebrated *Adenocheiradologia*. An evergreen incident in the history of the exercise of the royal touch has been recorded for the edification of all English-reading posterity by Britain's greatest biographer, and enshrined in art by her greatest portrait painter. Most readers, of course, need hardly be told that I refer to the case of Samuel Johnson, who was "touched" by Queen Anne at the age of five. This artistic record is particularly fortunate, as the practice was then declining towards its final extinction. The "merry monarch's" exercise of the royal gift had indeed been so vigorous as to elicit the sarcastic comment of his witty boon companion, the Earl of Rochester: that the Kings of England continued to decorate themselves with the title of King of France solely for the purpose of preserving thereby the privilege of curing the King's Evil. And when his bastard son laid claim to the crown of his successor, one of the special items of demonstrative testimony which he advanced in his own favor was the exercise of the royal gift of healing by touch. The success claimed did not, however, enable the Duke of Monmouth to save his own neck, which was divided by the headsman's axe for the treasonable usurpation; and his uncle, James II, did not long enjoy the regal privilege attached to England's throne. But the belief in the incredible and the hankering after the unattainable, which are always reflected from the emotional side of human nature under stimulation, preserved the recollection of the practice, and the desire to believe in its efficacy among the ignorant, the physically afflicted, the poverty-stricken, and the oppressed—especially in the remoter parts of the country. Accordingly, there existed in my boyish days, sprinkled at moderate intervals of distance throughout the western—and, I believe, all other—counties of Ireland, persons who possessed fragmentary items of "Royal blood and remains," by the potent contact of which the requisite number of times and at due intervals, the King's Evil was infallibly cured. If failure occurred, it was necessarily due to some moral or religious taint in the patient's system which neutralized the efficacy of the royal emanations.

The other special form of healing by touch occurred in the practice of the seventh son, whose hand possessed the power of curing "ringworm" by contact. The contact possessed more "virtue" if no daughter had appeared in the series of sons. And it was surely infallible if the healer happened to be the seventh son of a seventh son—father and son in an unbroken series of males. And if such privileged person happened to become possessed of a fragment of the royal relics, the faith in the efficacy of the latter for the King's Evil was always intensified, although there was no direct relationship between ringworm and King's Evil. Indeed, the nature of the former may still be regarded as obscure. So far as I was ever able to ascertain in those bygone days, the "lumps" which formed in the neck and—more rarely—in the armpit and groin, of youngish people, were of three varieties: the "gathering," which formed "matter" in its interior, and should always be "lanced;" the "ringworm," which was less rapid in growth and, as it formed no "matter," should never be "lanced;" and the "evil," which was slow and sneaky, and after a prolonged course formed open sores, which caused great disfigurement in exposed places, and if left to themselves, might last for years, or forever.

As it need hardly be said that the touching treatment of the "evil" was not by any means found to yield satisfactory results in all cases, other remedies were always sought for and eagerly adopted whenever reported upon. I had sometimes heard vague rumors of the existence of "herb-cures," which were kept—as might be expected—great secrets by their enviable possessors. But it was not till after I had been for some years in possession of a professional diploma that I was able to find an opportunity of obtaining first-hand information regarding the data of one of those modes of healing. I was rather glad, however, that the healer belonged to my own country. Rather curiously, indeed, the only other connection which he had with the profession of healing was by the last link of the chain of human existence—in the capacity of grave-digger. He exercised the functions of sexton of a parish church in my native county of Roscommon, close to the bordering Shannon, which there separates it from the adjacent county of Leitrim. The quiet, wavy, hilly-hollow, emerald clad fields of this quiet locality have reflected the first light on some of the most enlightened and enlightening members of our profession. Within a very short distance of the churchyard where my sexton friend cured and buried his neighbors, our native western air was first breathed by him whose "brief, brave and glorious young career" was a few years ago so suddenly and sadly terminated in his prime, and whose place will ever remain unfilled in the breasts of those who were privileged to enjoy the intimate friendship of Thomas Heazle Parke. And close beside the birthplace of the medical hero of the *Emin Pasha Relief Expedition* is that of Dr. Michael F. Cox, one of the highest living

authorities on Irish history and antiquities; and who will, I earnestly hope, throw some additional light on the folklore medicine of that locality. Quite near the same spot lived and died the maternal grandparents of that inspired member of our profession, who of all the brilliant medical men that Ireland has produced has surely secured the firmest hold on future immortality. Those who know anything of Irish country life are aware how very usual it was for a married lady to go to her mother's home to pass through the trying period of her parturition; and (in accordance with this custom) local tradition states, and—from its nature and origin—I believe with absolute accuracy, that in the same parish where my friend practiced his herbal cure was born one of the brightest ornaments of the world's literature, and of the medical profession. The misleading information supplied by speculative biographers and hackney journalists will probably not have prepared the majority of my readers for what should send a thrill through the breast of each and all, when I mention the honored name of Oliver Goldsmith.

It was during the same holiday sojourn in the country that I learned the contents and mode of application of a country herbalist's "cure" for the "King's Evil"—of great local celebrity, and the unbroken local tradition which has always existed there regarding the birthplace of Goldsmith. Soon afterwards, I published a note on the subject of each of these items of information; and a few years later, Dr. Michael F. Cox published in the *National Literary Journal*, a paper dealing with the disputed data regarding the birthplace of the author of "The Vicar of Wakefield," with the exhaustive thoroughness and lucid precision which characterize all his work, whether medical or literary. And I was more than gratified to find in the delightful volume which has just been published by Rev. J. J. Kelly on "The Haunts of Goldsmith," that he offers the most satisfactory evidence of the fact that his hero was a fellow-countryman of Thomas Heazle Parke, of Michael F. Cox, of Douglas Hyde (the distinguished president of the Gaelic League), and—of the humble writer of the present communication. The appearance of Professor Landonzy's very interesting article recalled these various associations, and induced me to rake together the more noted—all more or less dubiously successful—of the endless series of remedies which the unsatisfactory pathology and therapeutics of former ages offered to the victims of scrofulous disease. I only hope that in the Greater Ireland which now exists in the American Commonwealth, the concretion of which the Roscommon sexton's "herb-cure" forms the nucleus may not be found by the readers of *American Medicine* quite void of interest, professional or general.

I made the acquaintance of my "herbalist" friend as he was engaged in his customary vocation of digging a grave—for (I was told) a girl of about 19, who had

died from a gradual "decline" caused by the discharge from a number of "running evils," which had developed in the neck and various parts of the limbs. I visited the place in company with the incumbent of the parish, who introduced me to his adjutant; and who, being of a jocular disposition, made some remarks on the accidental meeting of two professors of the healing art, and quizzed the sexton by observing that his present task might have been indefinitely postponed—if the friends of the poor victim of early decline had been judicious enough to avail themselves of his services in his other capacity. This led to further conversation, and ultimately to the friendly communication to me of a description of his treatment of the "King's Evil." His "cure" was carried out in three stages:—(1.) The "sore" was poulticed with a preparation of the leaves of the "cuckoo-sorrel." (2.) The "dressing" consisted of a preparation of the root of the "Sweetmeadow." (3.) Application of a "plaster" compounded of beeswax, sheep suet, yolk of egg, first flour.

The leaves of the cuckoo-sorrel were gathered when rich in sap, placed in a saucepan on the fire, and "stewed in their own sap," by being continuously crushed and squeezed in various directions, and moved about so as to prevent their sticking to the bottom or sides of the saucepan, and so getting burnt. When reduced by this process to a somewhat jelly-like mass, the latter was spread "even" on a piece of calico or linen cloth and applied to the sore. The application was always a very painful one.

When the sore was fairly "cleansed" by repeated applications of this dressing, the first stage of the cure was considered complete. The root of the sweetmeadow was then procured; "the present year's growth—soft and mellow"—was always employed. It was carefully scraped so as to free it from all particles of adhering earth, and thoroughly pounded so as to bring it to a pretty uniform consistence. This was also spread on a cloth, after having received on its surface a layer of the richest cream; which, in turn, was varnished by a coating of the "scum from the churn-cup."

The belief of the efficacy of this cure for the otherwise so unmanageable "King's Evil" was strongly corroborated by local testimony, and excited my curiosity to investigate on my return home the previous therapeutic history of the plants named—if they had any.

Accordingly, I was greatly interested in finding this Irish rural remedy for "scrophulous ulcers" mentioned by Dr. Beddoes* in his very remarkable "Consideration on the Medicinal Use of Factitious Airs, and on the Manner of Obtaining them in Large Quantities," and quoted from him by Dr. Thomas Winterbottom, Physician to the Colony of Sierra Leone, who points out its similarity to a "cure for ulcers" which he had found "used by the

* Dr. Beddoes quotes the strong evidence of Mr. Edgeworth regarding the efficacy of the remedy, to whom its original communication to the writer must have been due.

people about Bassa, on the Grain Coast." The Irish remedy "is composed of leaves and stalks of wood sorrel (*Oxalis acetosella*) and the root of meadow sweet (*Spiraea ulmaria*)." The application is thus described by Dr. Beddoes: "The sorrel he prepares by wrapping it in a cabbage leaf, and macerating it by its own juices in warm peat ashes. This pulp is applied as a poultice to the ulcers, and left 24 hours; the application of sorrel is four times repeated; then the roots of the meadow sweet, bruised and mixed with the sour-head or efflorescence that appears on buttermilk left in the churn, are used in the same manner till the sore heals, which I was told always speedily happens, often in 2 or 3 weeks."

Dr. Winterbottom's account of the corresponding surgical remedy of the aboriginal African tribe is as follows: "The leaves of the amelliky are used by the people about Bassa, on the Grain Coast, in the cure of ulcers. The young leaves, after being moistened in water, are wrapped in a piece of plantain leaf, and laid upon hot ashes; when thoroughly warmed they are taken out, and their juice is pressed out upon the sore, which is then covered with a piece of plantain leaf, made hot in the fire; the juice is of a brownish color, of a slightly acid and astringent taste. *I saw it effectual in a small, obstinate, ill-looking ulcer, which had resisted every other application.*" [The italics are mine.]

Subsequent research showed me that the herbs in question had, respectively, enjoyed high pharmacological reputations down to about the middle of the present century; when, like many others of venerable fame, they were retired to make room for junior competitors. In the interesting work of Roques, *Plantes Usuelles, Indigènes et Exotiques* (Paris, 1808), I find the following notice of the common sorrel:

Oseille (Rumex Acetosa): "Desbois de Rochefort a parlé avec enthousiasme des propriétés de l'Oseille. Selon lui, les fièvres intermittentes qui ont résisté aux amers et au quinquina, cedent, comme par enchantement, à l'usage de cette plante, surtout s'il existe des symptômes scorbutiques."

In Woodward's *Medical Botany* (2d edition, London, 1810) is the following notice, which proves that its value was appreciated in Great Britain:

"The *Acetosella* is totally inodorous, but has a grateful acid taste, which is more agreeable than the common sorrel (*Rumex Acetosa*), and approaches nearly to that of the juice of lemons, or the acid of tartar, with which it also corresponds in a great measure in its medical effects, being esteemed refrigerant, antiscorbutic, and diuretic. It is recommended by Bergius in inflammation, bilious and putrid fevers, and from the cases aduced by Francus, he concludes, '*acetosellam appetitum restaurare, vomitum consopire, alvum stringere, sitim sedare, oris amaritiam tollere, cordis vires reparare, anginam abigere.*' The principal use, however, of the *Acetosella*, is to allay inordinate heat and to quench thirst; for this purpose a pleasant whey may be formed

by boiling the plant in milk, which, under certain circumstances, may be preferable to the conserve directed by the London College, though an extremely grateful and useful medicine. Many have employed the root of Lujula, probably on account of its beautiful red colour rather than its superior efficacy. An essential salt is prepared from this plant, known by the name of Essential Salt of Lemons, and commonly used for taking ink-stains out of linen."

In the *Medical Botany* of Stephenson and Churchill (new edition by Gilbert and Burnett, London, 1834) we read: Wood-sorrel is inodorous, but possesses a very agreeable and refreshing acid taste. Twenty pounds of the fresh plant yielded to Neuman six pounds of juice, from which he got two ounces, two drams, and one scruple of the binoxalate of potash, and two ounces six drams of an impure saline mass. The binoxalate of potash is one of three subspecies of oxalate of potash, and exists ready formed in *Oxalis acetosella*, *Oxalis corniculata*, and different species of *Rumex*, from which it is extracted in some parts of Europe in large quantities. Hence it is known by the name of salt of wood-sorrel, and in this country is sold as essential salt of lemons, mixed with an equal quantity of cream of tartar. It is mentioned by Duclos in the *Memoirs of the French Academy* for 1668. Marcgraff proved that it contained potash and Scheele discovered its salt to be the oxalic. It may be formed, as Scheele has shown, by dropping potash very gradually into saturated solution of oxalic acid in water; as soon as the proper quantity of alkali is added, the binoxalate is precipitated. But care must be taken not to add too much alkali, otherwise no precipitation will take place at all.

"MEDICAL PROPERTIES AND USES.—The leaves of this plant are among the most grateful of the vegetable acids. The juice of sorrel is sometimes used as an agreeable refreshing drink in fevers, and the leaves boiled in milk form a pleasant whey; but the other vegetable acids are quite as useful and more available: Beaten up with fine sugar, the leaves make a refreshing and wholesome conserve: 'its flavor resembling green tea.' The leaves in a recent state form a good salad for the scorbutic, and have been employed with advantage as an external application to scrofulous ulcers." So that we have more than ample evidence to demonstrate the appreciation of the therapeutic value of the sorrel family in the first half of the nineteenth century.

An additional interest for us Irishmen is super-added, in the fact that it has been claimed by a high botanical authority that the wood-sorrel is really the genuine original *shamrock* of St. Patrick. On this subject, Mr. Bichene, then Secretary of the Linnæan Society, read a paper on the appropriate date of St. Patrick's Eve, 1830. An abstract appeared in the *Philosophical Magazine* of the following June. He there observes that it would seem "a condition at least suitable if not necessary to a national emblem that it should be

something familiar to the people, and familiar, too, at that season when the national feast was celebrated. Thus the Welsh have given the *Leek* to St. David, being a favorite oleraceous herb, and the only green thing they could find on March 1; the Scotch, on the other hand, whose feast is in autumn, have adopted the *Thistle*. The white clover is not fully expanded on St. Patrick's Day, and wild specimens of it could hardly be obtained at this season. Besides, it was probably, nay, almost certainly, a plant of uncommon occurrence in Ireland during its early history, having been introduced into that country in the middle of the seventeenth century, and made common by cultivation. He then referred to several old authors to prove that the shamrock was eaten by the Irish, and to one who went over to Ireland in the sixteenth century, who says it was eaten and was a sour plant. The name also of shamrock is common to several trefoils, both in the Irish and Gaelic languages. Now clover could not have been eaten, and it is not sour. Taking therefore all the conditions requisite, they are only found in the wood-sorrel, *Oxalis acetosella*. It is an early spring plant; it was, and is, abundant in Ireland; it is a trefoil; it is called *Sham-rog* by the old herbalists; and it is sour; while its beauty might well entitle it to the distinction of being the national emblem. The substitution of one for the other has been occasioned by cultivation; which made the wood-sorrel less plentiful, and the Dutch clover abundant."

In passing backward to the voluminous Herbals of former centuries, we find copious notices of the great therapeutic virtues and multitudinous preparations of this plant and its numerous cousins.

In the *Theatrum Botanicum* (1640), Parkinson describes no less than fifteen varieties of *Acetosa*, and gives the following general account of the whole:

"*The Names*.—It is called in Greek *ὄξαλις*, *oxalis* of the sharpe taste, many of the Latine writers keepe that name, in Latine also *Acetosa*, and of some *Acedula* of the sournesse thereof; others call it *Rumex hortensis*, and *Galen calleth it ὀξύλιπατον Oxulapathum, id est, Lapathum acidum*, soure Docke, yet with *Dioscorides, Oxyleapathum* is *Lapathum Acutum*, that kinde of Docke whose form of leafe is more sharpe and pointed than others, and not for the sharpe taste to cause that name, the Sheepes Sorrel, is called *Lapatiolum* and *Acetosella* by divers. *Clusius* maketh mention of the first great sort, and *Lobel* of the second. *Dodonaeus* and *Lobel* gave first of all others knowledge of the third, and *Columna* of the fourth; *Bauhinus* of the fifth, sixth and seventh. *Columna* of the eighth. *Prosper Alpinus* in his Booke of *Egyptian* plants of the ninth: of the tenth and last none hath made any mention; now *Beslerus* in *horto Eystetensi* speaketh of the eleventh by the name of *Acetosa vesicaria peregrina*, which *Bauhinus* called *Acetosa Americana foliis longissimis pediculis donatis*; but of the twelfth sort (if it be not the same with the second whereunto it is very like), no author ever made mention before now, and scarce is it knowne to any but the Gentleman of Anglesey, called *Mr. Morris Lloid*, of *Prislierworth*, that found it on a

mountaine in Wales, and showed it to *Dr. Bonham* in his life; the thirteenth is called by *Matthiolus Tenuifolia*; and so by *Lonicerus. Gesner. Tragus.* and almost all other writers of herbes in our later age, and called *Oxalis vervecina* of *Lobel* and *Ovina* of others, and *arvensis lanceolata* by *Bauhinus*. The fourteenth is remembered by *Montanus, Gerard, and Bauhinus*. All of them deservedly have the name of *Sorrell*, because howsoever they are somewhat different in leafe or roote, yet they all agree in the sournesse, although some more or lesse than others. The *Arabians*, as *Serapio* saith, call it *Humaalh*; the *Italians Acetosa*; the *Spaniards Azederas Azederilha* and *Agrethas*; the *French Azeille* or *Ozeille, Saltette, Surelle, and Aigrette*; the *Germanes, Saw-rampffer*; the *Dutch Surckcle* and *Surincke*; and we in *English, Sorrell*.

"*The Vertues*.—*Sorrell* is cooling and drying in the second degree, and is prevalent in all hot diseases to coole any inflammation and heate of bloud in agues pestilentiall or chollericke, or other sicknesses and fainting, rising from heate, and to refresh the overspent spirits with the violence of furious or fiery fits of agues, &c., to quench thirst, and to procure an appetite in fainting or decayed stomackes; for it resisteth the putrefaction of the blood, killeth wormes, and is a cordiall to the heart which the seede doth more effectually, being more drying and binding, and thereby also stayeth the hot fluxes of the menstrues, or of humors in the bloudy flixe, or fluxe of the stomacke: the rootes also in a decoction or in powder, is effectull for the said purposes: both rootes and seede, as well as the herbe is held powerfull to resist the poison of the scorpion, so that he that shall eate thereof shall feelee no paine being stung: the decoction of the rootes is taken to help the jaundise, and to expel gravell, and the stone in the raines or kidneyes: the decoction of the flowers made with wine and drunke helpeth the blacke jaundise, as also the inward ulcers of the body or bowells. A syrupe made with the juyce of *Sorrel* and *Fumitterie* is a soveraine helpe to kill the force of those sharpe humors that cause the itch: the juyce thereof with a little vinegar, serveth well to use outwardly for the same cause, and is also profitable for frettings and gallings of the skin in any part, and for tetters, ringwormes, &c., it helpeth also to discusse the scrophules or kernells in the throate, and the juyce gargled in the mouth helpeth the sores therein: the leaves wrapped up in a Colewort leafe, and roasted under the Embers, and applied to an hard empostume. botch. bile, or plague sore, both ripeneth and breaketh it: the juyce of *Sorrell* dropped into the eares of such as are hard of hearing helpeth oftentimes: the distilled water of the herbe is of much good use for all the purposes aforesaid. The lesser *Wilde Sorrell*, and so all the other are of the same qualitie, are no lesse effectull in all the diseases before spoken of."

The wood-sorrel is treated separately in the following chapter, which I accordingly quote in its entirety:

"*Oxys, Alleluja sive Trifolium Acetosum*. Wood Sorrell.

"There are two sorts of Wood Sorrell, the one familiar enough in many places of this land, the other a stranger—as farre as I can learne, and onely cherished in the Gardens of those that are curious, I have as I said brought these two sorts from their family, where they might otherwise be ranked that is among the Trefoiles for their propertie and name also, in part.

"1. *Trifolium acetosum vulgare*, Common Wood Sorrell.—The common Wood Sorrell groweth low upon the ground without any stalke rising from it, having a number of leaves comming from the roote made of three leaves like a Trefoile or Three leafed grase, but broad at the ends, and cut in the middle, of a faint yellowish greene colour, every one standing on a long footestalke, which at their first comming up are close folded together to the stalke, but opening themselves afterwards and are of a fine soure relish, more pleasing then many of the former Sorrells, and yielding a juyce, which will turne red when it is clarified, and maketh a most daintie cleare Syrup: among these leaves rise up divers slender weake foote stalks, not growing above them, with every one of them a flower at the top, consisting of five small and pointed leaves starre fashion, of a white colour in most places, or in some dasht over with a small shew of blush, and in some but on the backe side onely: of any other colour (although some have set downe that it beareth deepe coloured flowers) I have not scene: after the flowers are past, follow small round heads, with small yellowish seede in them: the rootes are nothing but threads or small strings fastened to the end of a small long piece, all of them being of a yellowish colour not perishing every yeare, but abiding with some leaves thereon in the Winter.

"2. *Oxys luteo flore* Wood Sorrell with yellow flowers. This Wood Sorrell shooteth forth divers slender weake reddish stalks trailing upon the ground, and taking roote at the joynts as they lie, spread into many branches with many leaves on them, standing singly one above another, and made of 3 leaves cut in at the ends like the former, but are much smaller, and of a paler greene colour: at the joynts with the leaves come forth three or foure small flowers together, at the end of a long foote stalke, yet each separate from other, consisting of small and pointed leaves like the other, but of a yellow colour: the seede that followeth is brownish like the other, but contained in smaller and longer heads like cods or hornes, yet not crooked but pointed small which quickly fall away being touched when they are ripe, and springe up againe all about where it grew; it abideth the Winter without perishing, if it be not too violent, else they will rot and perish & must be new sowne againe.

"The Place.—The first, as I said, groweth plentifully in many places of our Land, in Woods, and Wood sides where they may be moist and shadowed, and in other places that are not too much open to the sun: the other groweth in divers shadowie places about *Sevill in Spaine* and in Gardens at Mompelier.

"The Time.—The first flowreth early in *Aprill* and *May*, the others after *Midsommer*, and so continueth in flower until the *Autume* colds perish it, and the seede is ripe in the meantime.

"The Names.—It is generally taken to be the *Oxys* of *Pliny*, whereof he speaketh in his 27. Booke, and 12. Chapter, but not the *Oxytriphylum*, although *Traquas* and *Lacuna* did so call it, because the name did somewhat agree thereto, but that it is another herbe whose sharpe pointed leaves, and not the sharpe taste caused this name, for δέν the Greeke word doth signifie both. Sharpnesse in forme and in taste. It is called *Trifolium acetosum* of divers, which is the same in signification as I said with *Oxytriphylum*, and of some *Panis Cuculi*, *Cuckowbreade*, eyther because the Cuckowes delight to feede thereon, or that it beginneth to blossom when the Cuckow beginneth to utter her voyce; it is called by the

Apothecaries in their shoppes *Alleluja* and *Lujula*, the one because about that time it is in flower when *Alleluja* in antient times was wont to be sung in the Churches, the other came corruptly from *Iuliola* as they of *Calabria* in *Naples* doe call it, as *Scaliger* upon *Theophrastus de causis plantarum* saith, yet it is there set downe *Alleluja*, but I thinke it rather should be *Lujula*. The other is called *Oxys flore lutes* of *Clusius*, and *Oxys lutea corniculata repens* of *Lobel*, and of *Bauhinus* *Trifolium acetosum corniculatum*. The *Italians* call it *Trifolio acetoso Pan cuculi* and *Alleluja*. The *French* *Pain de coqu*. The *Germans*, *Sawerklee*. The *Dutch*, *Coeckcoebrœet*, and we in *English* Wood Sorrell, Wood sower, Stabbewort, and Sorrell dubois.

"The Vertues.—Wood-Sorrell is cold and dry as the other Sorrells are, and serveth to all the purposes that they doe, being as effectually if not more, especially in hindring the putrefaction of blood and ulcers in the mouth and body, and in cooling and tempering distempered heats and inflammations, to quench thirst, to strengthen a weake stomacke, to procure an appetite, to stay vomiting, and most singularly excellent in any contagious sicknesse or Pestitential Feaver, the Syrupe made of the juyce is effectual in all the causes aforesaid, and so is the distilled water of the herbe also; Spunges or linnen clothes wet in the juice and applied outwardly to any hot tumors and inflammation doth exceedingly coole and helpe them: the same juice taken into the mouth and there gargled for some time, and after spit forth and fresh taken, will wonderfully helpe a stinking, foule Canker or Ulcer therein: it is also singular good in wounds, punctures, thrusts, and stabbes into the body, to stay the bleeding and to cleanse and heale the wounds speedily, and helpeth well also to stay any hot defluxions, or catarrhes upon the Throat and Lungs."

The herb which forms the second ingredient of our remedy is thus described by the same author:

"*Ulmaria sive Regina Prati*.—Meadowsweete or Medesweete.

"1. *Ulmaria Vulgaris*, Common Mede or Meddowsweete. The stalkes of this Medesweete are reddish and easie to breake, rising to be three foote high, and sometimes to be foure or five, having at the joynts thereof large winged leaves, standing one above another at distances, which are made of many somewhat broad leaves, set on each side of a middle ribbe, being hard, rough or rugged, crumpled much like to Elme leaves, whereof it took the name, but having also some smaller leaves with them, even as *Agrimony* hath, somewhat deeply dented about the edges, of a sad greene colour on the upperside, and grayish underneath; of a pretty sharpe sent and taste very like unto Burnet, and will no lesse give a fine relish to a cup of claret wine if a leafe be put therein then Burnet; at the toppes of the stalkes and branches stand many tufts of small white flowers thrust thicke together, which smell much sweeter then the leaves; and in their places being fallen, come croked and cornered seede: the roote is somewhat woody and blackish on the outside, and brownish within, with divers greater strings and fibres set thereat, of a strong sent, but nothing so pleasant as the flowers or leaves, and perisheth not but abideth many yeares, shooting forth a new every spring.

"2. *Ulmaria major sive altera*.—The greater Medesweete. This Medesweete groweth higher then the former, with longer winged leaves set one above another upon the crested brownish stalkes, having long footstalkes upon them, each being divided, usually into three

parts, the two lowest one against another, and every part also consisting of three or five smaller leaves then the other, separate each from the other, being hard crumpled, and finely dented about the edges: at the tops of the stalke grow the flowers in longer spikes, more sparsedly and not so thicke thrust together, turning downe their heads which are white like the former, and smelling very sweete also, more nearely resembling a Goat's beard, whereof some have given it the name then the other; the roote is more woody, with many blackish strings which smell strong, and taste somewhat harshly; the stalks and leaves dye wholly downe every yeare, and rise againe in the spring.

"*The Place.*—The first groweth in moyst Meddowes that lye much wet, or neare the courses of water, and the later is found also in shadowie woods, and places very often.

"*The Time.*—They are found in flower, in some place or other all the three Summer months, that is, *June, July,* and *August*, and their seede is ripe quickly after.

"*The Names.*—They are not found mentioned by any of the ancient Greekes or Latines, onely some think it may bee referred to *Rodora* of *Pliny*. It is called by the later writers *Ulmaria*, a *foliorum Ulmi Similitudine*, of the likenesse of Elme leaves, of *Dodoneus Regina Prati*, and *Barba* and *Barbula Caprae*, or *Barba Caprina* of *Tragus*, and by him thought also that it might be *Picnocomon* of *Dioscorides* as *Gesner* in *hortis* and *Lonicerus* doe *Fuscius* calleth it *Barba capri*. and *Lobel Barbi capra*: *Cordus Medesusium*, from the *Germaine* word *Medessus*, that is, Meddowsweete. Some, as *Lugdunensis* saith, tooke the latter to be *Melandrium Plinii*, and some also call it *Drymopogon*; *Anguillara*, calleth them *Potentilla major prima* and *secunda*. and *Thalius* the greater sort *Argentina major*, *Anguillara* saith the *Italians* call it *Christoforiana*, the *French* call it *Barbe de Cheuvre*, and *Roine des greis*, the *Germans* *Geiscart*, and the greater *Wielde Geisbart*; and *Camerarius* saith *Wormkraut*, because as he saith the roote is often found, as if it were eaten by Wormes; but it is more likely for that it helpeth horses of the Bottes, and Wormes, and so he saith the countrey people used it; the *Dutch* *Reinette*, and as *Lobel* saith *Gheytenbladt*, and *Camecruidt*, in *English* *Medesweete* or *Meddowsweete*, and *Queene* of the fields or Meddowes.

"*The Vertues.*—Being neare a little in taste and smell with Burnet, they are most likely to bee neare of the same facultie, yet *Tragus* accounteth them more hot and dry, they are also used in the same manner, and for the same purposes, to stay all manner of fluxes, bleedings, and vomitings, and women's courses, as also their whites: it is sayd to alter and take away the fits of quartaine agues, and to make a merry heart, for which purposes some use the flowers, & some the leaves: it helpeth also speedily those that are troubled with the Collicke, being boyled in wine and with a little honey taken warme, it doth open the belly; but boyled in red wine and drunke, it stayeth the flux of the belly, &c., it helpeth the Bottes in horses as you heard before; being outwardly applied it healeth old Vlcers, that are cancrus or eating, and hollow or fistulous, which many have used and much commended; as also for the sores in the mouth, and secret parts: the leaves when they are full growne being layd upon the skinne, will after a small time raise blisters thereon. *Tragus* saith: the water thereof helpeth the heate and inflammation in the eyes; the seede as *Camerarius* saith being taken, causeth paines in the head;

and because both flowers and herbes are of so pleasing a sweete sent, many doe much delight therein, to have it layd in their Chambers, Parlors, &c., and *Queene Elizabeth* of famous memory, did more desire it then any other sweete herbe to strew her chambers withall: a leafe or two hereof layd in a cup of wine, will give as quick and as fine a relish thereto, as Burnet will, as I sayd before."

In *Salmon's Herbal* (London, 1710) elaborate attention is paid to the uses and preparations of Wood Sorrel, which was then, very evidently, at the zenith of its fame.

"OF SORREL WOOD, OR SOUR TREFOIL.

"I. *The Names.*—It is called in Greek *ὄξυς*, and in Latine, '*Oxys, Oxys Pliniana*' *Lib 27. Cap. 12. Oxytriphylum, Tragi* and *Lacunae* (but *Oxytriphillum* is a more proper name for the sharp pointed Trefoil:) *Trifolium Acetosum, Panis Cuculi* (Cuckows meat) also *Alleluja* (because it was in flower, when in ancient times, *Alleluja* was wont to be sung in Churches:) and *Luluja* (a corrupted word from *Juliola* as in *Calabria* in the Kingdom of *Naples* it is called:) in English, *Wood Sorrel*, or *Sour Trefoil*.

"II. *The Kinds.*—The chief sorts common with us are 1. *Oxys Plinii, Alleluja, Lujula, Oxys alba Communis, Trifolium Acetosum Vulgare*; Our Common Wood Sorrel. 2. *Oxys flore Luteo Clusii, Oxyslutea corniculata repens Lobelii, Trifolium acetosum corniculatum Bouhini, Oxys Americana*. Yellow Flower'd Wood Sorrel.

"THE DESCRIPTIONS.

"III. The first, or common Wood Sorrel. Its roots are nothing but strings fastened to the end of a small long piece, all of them being of a yellowish color, not perishing every year, but abiding with some leaves thereon in the Winter. It grows low upon the Ground without any Stalk, rising from it, having a number of Leaves coming from the Root, which Leaves are made of three parts like a Trefoil, but broad at the ends, and cut or dented in their middle (almost in form of a Heart) of a faint yellowish green color, each one standing on a long Footstalk, which at their first coming up, are close folded together to the Stalk, but opening themselves afterwards, and are of a pleasing sour relish, more grateful and pleasing than any of the former Sorrels, and yielding a juice, which will burn red when it is clarified, and make a most delicate clear Syrup. Among these Leaves, rise up divers slender weake Footstalks, not growing higher than them, each one having a Flower at its Top, consisting of five small and pointed Leaves, Star-fashion, of a white color in most places, or in some dasht over with a small show of blush, and in some (but on the backside only) of some other colors. The flowers being past, there follow small round heads, with small yellowish Seed in them.

"IV. *Gerard describes it thus.* Its root is very Threddy, and of a reddish color. It is a kind of three-Leav'd grass, and is a low and humble herb, without stalk: the Leaves immediately rising from the Root upon short stems: at their first coming forth folded together, but afterwards spreading themselves abroad, of a fair light green color, in number three, like the rest of the Trefoils, but that each Leaf has a deep cleft in the middle. Among these Leaves come up small and weak tender stems, such as the leaves do grow on, which bear small Star-like flowers of a white color, with some

brightness of Carnation dasht over the same. The flower consists of five small Leaves, after which come little round knaps or husks, full of yellowish seeds. The whole Herb is in Taste like Sorrel, but much sharper and quicker, and makes better Green Sauce than any of the former Sorrels. *Johnson* in *Gerard* says, that he had some of these Plants sent him, with very fair red flowers, which were gathered in a wood of *Sir Thomas Walsingham's* called *Stockwell Wood*, at *Chisselhurst*, in *Kent*, and in a little round Wood there adjoining.

"V. *The Second or Yellow Flower'd Wood Sorrel*. Its Root is a brush of Fibres, and abides all Winter without perishing, if it be not too Violent or Cold, the Extremity making them rot and perish, so that the Plant must be raised from Seed sown again. It shoots forth several slender, weak, reddish Stalks, trailing upon the Ground, yet growing in a heap as it were, the Stalks take Root at the Joints as they lye, spread into many Branches, with many Leaves on them, standing singly one above another, and made of three Leaves, cut in at the end like the former, but are much smaller, and of a Paler Green Color; at the Joints with the Leaves come forth three or four small flowers together, at the end of a long Foot-stalk, yet each separate from the other, consisting of small and Pointed Leaves like the former, but contained in smaller, and longer heads, like Cods or Horns, yet not crooked but pointed small, which quickly fall away being touched when they are ripe, and spring up again all about where it grew.

"VI. *The Places*.—The first grows very plentifully in many places in *England*, in Woods, and by Wood-sides, where it may be moist, and shadowed from the Sun, also in other place not too open to the Sun Beams. The Second grows in *Spain, Italy and Sicily*; but in a vast plenty in almost all our worne out Plantations of Maze, in *South Carolina*, and other places adjacent thereto, where I have gathered it many times: there is scarcely any Herb which grows in greater plenty in those Countrys than this.

"VII. *The Times*.—The first Flowers early in *April* and *May*; the others in *June, July* and *August*, and so continues in flower, with the Cold of *Autumn* causes it to perish, the Seed ripening in the meantime.

"VIII. *The Qualities*.—These are of the Temperature, and properties of Common Sorrel in the former Chapter; but more potent to all those purposes, and are special Alexipharmicks or Antidotes against the Plague, and all sorts of Pestilential, Malign, and Burning Fevers.

"IX. *The Specification*.—Wood Sorrel resists Vomiting, strengthens the Stomach, hinders putrifaction of the Blood, quenches Thirst, provokes Appetite, and is effectual against the Plague, Spotted Fever, Calentures, and other like Malign diseases.

"X. *The Preparations*.—You may take therefrom. 1. A Juice. 2. A Decoction or rather infusion. 3. A Syrup. 4. A Conserve. 5. A Cataplasm. 6. A Distilled water.

"THE VIRTUES.

"XI. *The Juice*.—It has all the before Specified Virtues, cools Inflammations, takes away all præternatural heats, whether in the Stomach, Bowels, or habit of the Body, resists putridity, and is most singularly excellent against any Contagious Sickness or Pestilential Fever. Mixt with a fit quantity of double refined Sugar, it makes most incomparable Green Sauce.

"XII. *The Decoction or Infusion*.—They have the Virtues of the Juice, but not so effectual, and may be

given half a Pint at a Time: if they are made in Wine (whether White or Red) they will be so much the more effectual in some cases, more especially where no Fever is present.

"XIII. *The Syrup*.—It is effectual in all the Cases aforementioned, does exceedingly cool, and abate the heat of Fevers; and mixed with the Juice, makes an excellent Gargarism for a Sore Mouth, and Throat, being Gargled therewith and spit out, and then fresh taken in; it wonderfully helps a stinking foul Canker, or Ulcer in those parts; and is singular good in Wounds made by Cut or Puncture, stopping their bleeding, and causing them speedily to heal.

"XIV. *The Conserve*.—It is Cordial, refreshing in hot Fevers, stops Vomiting, and strengthens a weak Stomach, and is profitable against Catarrhs or hot defluxions of Rheum upon the Stomach and Lungs.

"XV. *The Cataplasm*.—It is made either of the whole green Herb bruised: or made of the Herb, stewed between two Pewter Dishes, and brought to a Consistence with Crumbs of white Bread. It abates the heat of Inflammations and other hot Tumors, cures simple Confusions, being presently applyed, viz. whilst they are recent; applied to simple green Wounds also, it heals them in a short time, by stopping the Hemorrhage, and conglutinating their Lips.

"XVI. *The Distilled Water*.—It has all the Virtues of the Juice and Decoction or Infusion, but very much weaker: It quenches thirst, and cools inward heats of the Stomach, Lungs and Liver, being taken morning, noon, and night, half a Pint at a time, sweetned with the Syrup aforementioned; and so mixed it makes a good Gargarism for Sore and Cankerous Mouths and Throats."

The same notable authority gives a correspondingly elaborate and appreciative account of the qualities, uses and preparations of the second herb which enters into the composition of our cure:

"OF MEDE-SWEET: OR, QUEEN OF THE MEDDOWS.

"I. THE NAMES.—It is thought to be unknown to any Ancient Greek or Latine authors: but later Writers call it *Ulmaria*, a *foliorum Ulmi*, *Similitudine*, from its likeness to *Elme* leaves in *English*, *Mede-Sweet*, *Meddow-Sweet*, and *Queen of the Meddows*.

"II. *The Kinds*.—There are two Species hereof, viz. 1. *Ulmaria Vulgaris*: *Regina Prati Dodonoei*; *Barba*, vel *Barbarla Caprae*, or *Barba Caprina Tragi*; *Barba Capri Fuchsii*; *Barbi Capra Lobelii*; *Medesusium Cordi*, our common Mede-Sweet, or Meddow-Sweet: some have thought it to be *Rodora Plinii*, but this cannot be positively affirmed: *Tragus* thought it might be *Picnocomon Dioscoridis*, as did also, *Gesner* in *hortis & Lonicerus*. 2. *Ulmaria Major sive altera*. *Potentilla Major prima Anquillarae*, *Argentina major Thalii*. The Greater Mede-sweet, or Meddow-sweet. *Lugdunensis* says, some took it to be *Melandrum Plinii*; and some call it *Drymopogon*. *Camerarius* says the *Germans* call the first *Worm-Kraut*, *Worm-Wort*, because says he, the Root is often found as if it were eaten by Worms: but it is more likely, from its curing Horses of the Botts and Worms, for which purpose the Country people used it.

"THE DESCRIPTIONS.

"III. *The First*, or *Our Common Mede-Sweet*. It has a Root which is somewhat Woody and blackish on the out side, and brownish within with several greater Strings and lesser Fibres adjoining; of a strong smell,

but nothing so pleasant as the Flowers or Leaves; it perishes not in *Winter*, but abides many Years, shooting forth a new every Spring. Its Stalks are reddish and easy to break, rising to be 3 Feet high, and sometimes to 4 or 5; having at the Joints thereof, large winged leaves, standing above one another at Distances; which are made of many somewhat broad Leaves set on each side of a middle Rib, (being hard, or rugged, and Crumpled much like to *Elme* Leaves, from whence it took its Name; but having also some smaller Leaves with them, like as *Agrimony* has, something deeply dented about the edges, of a sad green color, on the upper side, and greyish underneath; of a pretty sharp smell and taste, very like unto *Burnet*; and will no less give a fine relish to a Glass of Wine, if a few leaves thereof be put therein. At the tops of the Stalks and Branches, stand many tufts of small white Flowers, thrust thick together, which smell much sweeter than the Leaves; which being fallen, in their places come crooked and coloured Seed, crookedly turning or winding one another, and so making a fine little Head.

"IV. The Second, or *Greater Mede-sweet*, or *Meddow-sweet*.—The Root of this is more woody than the former, with many blackish strings, which smell strong and taste somewhat harshly. This Plant grows higher than the former, with longer winged Leaves, set one above another upon the Crested brownish Stalks, having long foot Stalks supporting them; each being usually divided into three parts, the two lowest one against another; and every part also consisting of three or five smaller Leaves than the other, separate each from the other, being hard, crumpled and firmly dented about the edges, at the tops of the Stalks grow the Flowers in longer Spikes, more sparsely, and not so thick thrust together, turning down their Heads, which are white like the former, and smelling very sweet also, more nearly resembling a *Goat's Beard* (which Name some Authors have given to it), than the first kind here described. *Gerard* says it has leaves of the bigness of *Wild Angelica*, and grows somewhat after the manner of *Wild Angelica*: that the Stalks are crested and divided into several Branches, which carry long bending Spikes or Ears of white Flowers or Seeds, each single Flower and Seed being something like the former.

"V. The Places. The first grows in moist *Meadows* which by much wet, or near *Watercourses*, as the sides of *Rivers*. and watery *Ditches*, almost everywhere. The second grows in Woods, Copses, and shady places in *Germany* and other countries, but here in *England*, only in *Gardens*.

"VI. The Times. They are found in Flower through all the three *Summer* months, viz. *June*, *July* and *August*, and their Seed is ripe in some short time after.

"VII. The Qualities. *Mede-sweet* is temperate in respect to heat or cold, but dry in the first Degree. Abstersive, astringent, and Traumatick, or Vulnerary; Cephalick, Neurotick, Stomatick, and Hysterick.

"VIII. The Specification. It stops Bleeding, and cures Fluxes of the Bowels of all sorts, stops the Whites, and Terms in Women, and gives ease in the Colick and Gripings of the Guts. And heals Wounds and old Ulcers.

"IX. The Preparations. You may make from either Flowers, Leaves, or Root, or from all of them, 1. A *Liquid Juice*. 2. An *Essence*. 3. A *Decoction or Infusion in Wine*. 4. A *Powder*. 5. An *Oil*. 6. An *Ointment or Balsam*. 7. A *Cataplasm*. 8. A *Distilled Water*. 9. A *Spirituos Tincture*. 10. An *Acid Tincture*.

"THE VIRTUES.

"X. The *Liquid Juice*. It stops all sorts of Fluxes, Bleedings, and Vomitings, as also the overflows of the Terms in Women, and the Whites. It is said to alter and take away the fits of Quartane Agues, eases the Gripings of the Guts and moves the Belly downwards. Outwardly applied it heals old Ulcers, which are cancerous or eating, and fills up fistulous or hollow Ulcers with Flesh, and cures Sores in the Mouth and secret parts. Dose from 2 to 6 Spoonfuls Morning and Night, or oftner in any Convenient Vehicle.

"XI. The *Essence*.—It has the virtues of the *Juice*, and is more powerful to all the Intentions before specified, and is only to be given from 1 to 3 or 4 Spoonfuls in any proper Liquor, Morning and Night. It is Cordial and very much Cheers the Heart.

"XII. The *Decoction or Infusion in Wine*. They have the Virtues of the *Juice* and *Essence*, but may be given from 2 to 6 or 8 Ounces, sweetened a little with white Sugar: It is very Stomatick, strengthens the Bowels, and causes a good appetite.

"XIII.—The *Powder*. It has the Virtues of the former Preparations, taken from half a Dram to a Dram in any proper Vehicle: if mixt with Honey and taken, it is good against Coughs, Catarrhs, Colds, Wheezings, Hoarsness, Shortness of Breath, and difficulty of breathing. Strewed plentifully upon old, moist and running Sores and Ulcers, it dries them, and induces a speedy healing: it is also said to kill Worms in Children.

"XIV. The *Oil by Insolation or Boiling*. It eases Pains being applyed, and strengthens weak Joints, which have been lately Set, or when the Bones have been Broken.

"XV. The *Ointment or Balsam*.—It digests, cleanses, and induces the healing of old running Sores, putrid Ulcers, Fistula's and the like, and breeds Flesh where it is wanting. Apply'd to Parts or Joints pained with the Gout, it eases them.

"XVI. The *Cataplasm*.—Made of the green Herb and laid upon the Skin, it will in a small time (as *Tragus* says) raise Blisters thereon. Apply'd immediately to the Biting of a mad Dog, or Stinging of a Scorpion, Hornet, &c., it draws out the Poyson and gives ease.

"XVII. The *Distilled Water*. It has the Virtues of the Juice, but nothing near so powerful: and being dropt often into the Eyes, it eases their pain, and allay their Heat and Inflammation. It may also serve as a Vehicle to take some of the other Preparations in.

"XVIII. The *Spirituos Tincture*. It is Cordial, Strengthens the Stomach and the Bowels, stops Fluxes of all kinds, causes an Appetite and good Digestion, and is profitable against inward Bruises: and gives present ease in the Colick.

"XIX. The *Acid Tincture*. It mightily strengthens the Stomach, and causes a good Appetite; and stops Vomiting tho' of long continuance. It may be taken in all the Patient Drinks, whether Ale, Beer, or Wine; so much at a time as to give the Liquor a pleasing sharpness; and that as well at Meals as between Meals."

In the year 1735 there was published in the Southern Irish capital, Corke, a small volume, bearing the title, *Botanologia Universalis Hibernica*. It was the work of a western Irishman, J. K'eogh, who was born and educated in the same Shannonside district in which I obtained the particulars of the rustic treatment of King's Evil, which forms the text of this paper, and

who had cultivated the bye-paths of medicine in the intervals of his professional duties as Chaplain to Lord Kingston. This (alphabetically arranged) treatise contains the following paragraphs:

"Ordinary Meadow SORREL—Hib. *Saugh-boh*, *Sealgan*, and *Saoch*, Lat. *Acetosa*, vel *Oxalis*. It grows in Corn Fields and Meadows, flowering in *May*. The leaves are *Antiscorbutic*, *Cordial* and *Styptic*, they Refrigerate, quench Thirst, Resist Putrefaction and are good in *Fevers*, the seed is put in astringent Medicines.

"Field SORREL, Sheeps Sorrel, or spear-pointed Sorrel, Hib. *Sauha Kuoragh* or *Keirogah* and *Savachyragh*. Lat. *acetosa*. *Arvensis*. It is like the great Sorrel, but much smaller. It grows in dry barren soil, flowering in *May*. It has much the same virtues as the former, but not so strong in its operation. It brings to suppuration Imposthumes and all kinds of Tumors, used inwardly it is *Deobstruent*, helps the *Jaundise* and quenches Thirst.

"Round Leaved, or Roman SORREL, Lat. *Acetosa romana rotundifolia Hortensis*. It grows in Gardens, and has the same Virtues and qualities that the Common Sorrel has.

"WOOD SORREL. Hib. *Samsogy*, *Shamsoge*, Lat. *Acetosella*, *Lujula* & *Trifolium acetosum vulgare*. It grows in Woody and shady places, flowering in *April*. It is more powerful in its medicinal Operations than Common Sorrel. It is *Cordial*, *Stomatic*, *Hepatic*, and *Hydrotic*, good against the *Jaundise* and *Dropsy*. It also modifies and heals *rotten Ulcers*.

"MEDDOW-SWEET, or Queen of the Meadow, Hib. *Airgid Lovaghra*, or *Arigudlugher*, Lat. *Ulmaria* & *Regina Prati*. It grows in moist Meadows, and by River sides, flowering in *June*. It is *Styptic*, *Alexipharmic*, and *Diaphoretic*. The Decoction or powder of the Roots stoppeth the *Diarrhea*, *Dysentery* and all kinds of *Fluxes*. The flowers in *White Wine* cure the *Tertian Ague*. It is also good in *Fevers* and malignant Disorders."

I have now, I think, placed sufficient evidence before my readers to show the high reputation which the herbs in question possessed during many centuries in the treatment, not only of the dreaded King's Evil, but of many of the other physical ills to which human flesh is heir. I will now digress for a time for the purpose of displaying the reputation of other remedies—many of which are now totally forgotten, or absolutely neglected—in the treatment of the special malady which has so much troubled the therapeutists of all the ages. In the "New London Dispensatory," compiled by William Salmon, the author of the Herbal, from which I have already quoted so largely, we find the following:

"*Artanitae*, *Cyclaminis*, of sow-bread, hot and dry in 3°. A plaster made thereof with hog's lard and Sulphur, helps the *Atheromata*, *Scrophula* and *King's Evil*...."

"*Asari* of *Asarabacca*. Hot and dry in 3°. The root hotter, but a safer purge than the leaves, of very subtil parts;.... It dissolves Wens and hard swellings, and is eminent against the King's Evil, long tedious Quartan Agues, Green Sickness and Asthma;...."

"*Bardanae majoris*, *Lappae*, *maj*. Of the great Burdock. Temperate.... In the Gout and King's Evil It is a specifick."

"*Chelidonii minoris*, *Scrophulariæ*, of Pilewort, it is temperate.... Outwardly in a balsam, it Cures the Piles in the Fundament, Wens, King's Evil, Sores and other creeping Ulcers, by anointing and putting tents into the holes dipt into the Balsam thereof; for which it is a Kind of Specifick."

"*Jalapae*, *Mechocannae nigrae*, of Jalap. Temperate and dry in 1°. It purgeth strongly all bad humors, chiefly those that are watery with great safety;.... and I have oftentimes found it a good specific in *Struma* or the King's Evil...."

"*Mecoacannae albae*, of Mechoacan, or Rhubarb of Peru:.... Temperate and dry in 1°.... It is good in the Rickets, Scurvy, King's Evil, Catarrh's, Dropsies, Jaundice, Gout, and French Pox;...."

"*Spatulae foetidae*, of Stinking Gladdon, hot and dry in 3°.... taking in the morning fasting in Rhendish Wine, it prevails against the Cachexia, Dropsy, King's Evil:...."

"*Bardana minor*, *Lappa minor*. The lesser Burdock; hot and dry in 1°.... Outwardly it is of excellent use in the King's Evil,...."

"*Capparis*, *Capers*; hot in 1°, and dry in 2°.... An extract of the Bark of the Roots.... very prevalent against Quartan Agues, hard Spleens, King's Evil, Palsies, Convulsions, Cramps...."

"*Cotyledon*, *Umbilicus veneris*, *Acetabulum*, Navil-Wort, or penny-wort; cold and moist in 1°.... The Essence prevails against the Sciatica and King's Evil."

"*Cyclamen*, *Cyclaminus*, *Arthanita*.... *Sow-bread*; hot and dry in 3°. The juyce of the leaves (or rather their Essence).... or in a Balsam, wasts knots, hard tumors, and swellings of the King's Evil;...."

"*Digitalis*, *Alisma*, Fox-Glove, hot and dry in 2°.... is an extraordinary good wound-herb, prevalent against the King's Evil,...."

"*Ebulus*, *Chamaeacte*, Dane-wort, or Dwarf-Elder, hot and dry in 3°.... The Essence.... kills Worms, helps dry Coughs, Quinsies, Asthma's, King's Evil and French Pox...."

"*Eryngium Triofolium*, Trefoil Thistle;.... opens obstructions of the Liver and Spleen, helps the Jaundice, Dropsie, Sciatica, French Disease, and King's Evil."

"*Ficaria*, *Scrophularia major*, Figwort, (a kind of Pilewort) hot and dry in 3°.... a good specifick in the King's Evil."

"*Fumaria bulbosa*, Bulbous, or Onion-Fumitory; hot in 2°, dry in 3°.... It is.... of singular force against the King's Evil."

"*Genista*, *Spartum*, *Σάπρον*, Broom, hot and dry in 2°. It opens, attenuates, is abstersive, diuretick, hepatick, splenetick and nephritick;.... 'Tis a great Traumatick, and Valuerary, and a Specifick in the King's Evil."

"*Hordeum*, *Distichon*, *Polystichon*, *κριθή*, Barly; cold and dry in 1°.... with Tar, Wax, Oyl, and Boys urine, it is effectual against the King's Evil."

"*Paronychia*, *Reduvia*, Whitlock-grass, hot and dry in 3°.... experience has confirmed it to be a great Specifick in curing of the King's Evil, being given only in small Beer not very many days together; it wasts the peccant humour, discusses the unbroken tumours, and heals the broken ones."

"*Primula Vevis*, *Verbosculum*, *ἀζίαμα*, Primrose, hot and dry in 1°.... It dissolves all tartarous Diseases of the Nerves, and is of great force in curing of the King's Evil,...."

"*Rhamni*, *Spinæ Cervinae fructus*, Buckthorn Ber-

ries, hot and dry in 2°....They are of great force against Cachexies, Dropsies, Jaundice, Gout, and King's Evil."

The products of the Animal Kingdom were also laid under contribution, although not so extensively. We are, for instance, told that, "*Talpa*....The whole Mole, the Ashes of it helps the running Gout, Leprosie, King's Evil, and Fistula's, outwardly applied, and inwardly drunk in Wine or Beer...."

Also, of "*Coluber*, *Colubra*, *Νίροφις*. The Adder....the Ashes are good against Wens, and King's Evil Sores." "Hoglice....are most admirable things, being given 100 days together or more, for the curing of all sorts of Cancers and Scirrhus Tumors in what part of the Body soever. The King's Evil, old sordid and rebellious Ulcers, Convulsions, the Rickets in Children, and dimness of Sight, yea blindness itself. I have also seen a very good effect of them being used for many days in the Cure of the French-Pox, for they resolve, cleanse and purifie to a Wonder."

Of the great number of mineral preparations recommended in the same volume for the cure of the King's Evil, I will mention but a few of those to which specially wonderful virtues were attributed.

"*Manna Mercurii*, Golden Panchymagogan....This is a great specifick and Secret against the French Pox, Gonorrhœa, and all manner of Venereal evils, it eases pains in all parts....and is made of wonderful Virtue for curing of the King's Evil...."

"*Tinctura florum Reguli Antimonii*....It is a Medicine of that universal purport that few can parallel it; for it rectifies most Distempers of the Stomach, frees the body from Excrements, it takes away Flegm, comforts the Spirits, restores and augments the natural heat, is an admirable thing against the Scurvy, Cachexy, and the Green-sickness in Virgins: It takes away Scabs, Itch, Scurff, and Morpew, cleanses the whole Mass of Blood of all putrefaction, and cures the King's Evil, Leprosy, and French Pox."

"*Oleum Arsenici Anodynum*....It is an excellent thing against all poysoned Wound, Ulcers and Cankers, Pocky boyls, sores, and breakings out, King's-Evil sores, bitings of Mad-dogs, Fistula's in the Fundament and elsewhere, being dissolved in Plantane, Rose, or Poppy water, and then the affected place washed therewith." And there are many others recommended with various degrees of confidence.

In the great encyclopædic treasury of pathology and therapeutics compiled by Theophilus Bonetus, *Medicina Septentrionalis Collatitia* (Genevæ, 1684), we find the then current pathologic notions of the King's Evil as well as all the recognized methods of cure. I will give some extracts from the English translation (London, 1684):

"Because there is a great likeness between the King's Evil and hardned glands (for they are alike both in place and matter), therefore we must do our endeavor to distinguish the one from the other. They differ first, because the matter of the Glands is more subtil and thin, of the King's-Evil more gross and viscid, and more contumacious, and hence it is, that whenever a thin and subtil matter is incrassated, of Glands they become the King's-Evil, which is *Galen's* meaning 1. *Le loc. aff.* 3. when he says, that Glands sometimes turn into the King's-Evil. Secondly, because indurated Glands are

more separable from the adjoining Flesh. So that by the touch you may easily know it from the Glands: But the King's-Evil is so propagated into the adjoining Flesh that it is a very hard thing to distinguish it. 3. Because the King's-Evil has a Coat, but the Glands are always without one. *Rogierius* the Surgeon advises to take Ivy Leaves, and Citron, and pound them together, and lay them to the Swelling: and if the Swelling fall in 3 dayes time, he says it is a sign they are Glands, and not the King's-Evil; but if they grow worse with the application, so as to be red and ake, it is a sign they are not Glands, but the King's-Evil...."

With regard to treatment we are told (under the same heading) how *Mercurialis* informs his readers that: "as soon as I observe Swellings arise in the Necks of Children, I find no more present Remedy than to exulcerate the Skin of the Head, for this is the most proper diversion and evacuation. But we must have a care not to draw Blisters in Children's Heads with *Cantharides*....But it is better to do it with Mustard, Nettles, Hony-suckle; yet with great moderation and prudence...."

"*Galen ad Glauconem*....tells him, that he gave astringent Medicines for the King's-Evil....in *Rhases lib. de Apostem.* it is found that Plantain is very good in the Cure of the King's Evil...."

"*Rondeletius*....affirms that he has cured several of the King's-Evil beginning, by laying Cypress nuts upon the part." In this mode of treatment he confesses that he was merely carrying out the precept of his master *Dioscorides*.

Felix Platerus is the authority advanced for the following:—"As we find that Narcoticks outwardly applied have a great dissolving faculty, so also, if applied in the King's-Evil, they will do much: As leaves of Mandrake, Henbane, Poppy, bruised, or roasted a little under Coals or boiled or used any other way by themselves. Also Mandrake root, or powder added thereto, &c. The rubbing also of the Scroffles till they grow red, does also conduce something to the discussion of them; and if it be used before the application of Topicks, it better disposes them to receive their virtue."

"By a potential Cautey, which making an eschar in the Skin without pain opens the Scroffles, I have often got them out: Or I have laid them bare, that they might be better suppurated by applying Medicines: But it is dangerous to attempt this by actual Cauterics, seeing an Inflammation might easily follow. Yet in an ignoble place they might very well be opened in this manner."

The following remarkably successful form of anti-scorfulous treatment has been transmitted to posterity by *Scultetus*, of *Armamentarium* celebrity:

"A certain woman had the scroffles all over her Neck, and she was cured in a Month's time. A powder of equal parts of Sugar, Ginger, and Turpeth was given her, which purges Phlegm particularly from the remote parts. After ceratum oxæleum was applied, they were softened with oyl of Lizards; Take green Lizards as many as you will, boyl them in common oyl, till they be burnt, and the oyl turn black: let the colature be put in a Glass and set in the Sun till the dreggs subside, the oyl grow clear, and it be of a brown colour. Then I gave every Morning for 30 dayes of the Electuary, which *H. Saxonia* and *J. Praevotius* reckoned as a most sure secret; take some common or green Lizards, cut off their Heads and tails and take out the Guts, infuse them in

strong white Wine Vinegar 40 dayes by themselves; then dry them and steep them in other Vinegar, and dry them again either in the shade or Sun, and reduce them to powder: which, being done, with one ounce of the powder mix 4 ounces of Honey. The Dose for Children is 2 drachms, or an ounce at most for 30 or 40 dayes."

The practice of Galen and of Severinus shows that the modern surgical method of wholesale extirpation of scrofulous glands is not so novel a mode of dealing with them as some latter-day operators would seem to have persuaded themselves.

"We forbear not to cut out Scroffles, though they be crude and hard Tumours, but then they must be moveable, and not fastened to the flesh, and we may draw them out with our Fingers, as we do *steatomata* and such things, having cut them from the Skin and severed them round, with a knife broad and sharp-pointed and crooked backwards, according to Galen, 14 m. m. cap. 11—

"I have tried this Chirurgical way of Cure with success in hundreds."

Bonetus closes his article on the subject with the following interesting list of

"MEDICINES ESPECIALLY MADE USE OF BY EMINENT PHYSICIANS.

"1. Drink every day out of a man's skull, and the King's-Evil will then vanish. The Mushroom that grows on a Birch-tree, put in Wine and drunk, has a singular Virtue in gradually curing and wasting the King's Evil." (Agricola.)

"2. It has been observed that Scroffles and other Tumors fall, if the Part affected be rubbed with a dead man's hand, for so long the swellings gradually vanish as the dead Body rots by degrees. (Bartholinus.)

"3. Root of Vervain hung about the Neck of one that has the King's Evil gives wonderful and unexpected relief. They say Silver-Knapweed is marvellous good; also red Poppy steeped in Wine, and bruised, and the mucilage applied to the Swelling, is a Medicine that does good by tempering, and has those Virtues which we require in Medicine for the King's-Evil, over drying things being excluded. (Baricellus.)

"4. Three Toads boyled in oyl Olive in a glazed Earthen Vessel, make an excellent oyl for the King's-Evil; but the fumes of them, while the oyl is in making are dangerous. Therefore, keep that vessel close, and have a care. First they apply Arsenick to the Scroffles, and blister them, then corrode the Part with Sublimate, and use the said Oyl, which will be yet better, if you infuse the salt of Toads in it. (Borellus.)

"5. This Potion has been often tried, which not only takes away the King's-Evil, but all Mucosities of the Throat; take of Broom-flower water 3 ounces, drink it warm with Sugar in the Morning. The Powder of Brown-flowers does the same mixt with Honey of Roses. (Sebast. Cortilio.)

"6. The lesser Celandine has 4 or 5 grains like Wheat growing to its root, which are used to draw out the Scroffles with great success. (Crollius.)

"7. Their cure depends upon the Meazles of Hogs, which may be calcined and sprinkled on them, and Oyntments may be made of them, which are very good for the cure of these Swellings and these Unguents may be fortified with distilled Oyl of Hogs-Lard, or distilled

Oyl of Hogs-Meazles, which is a specifick against the King's-Evil. (Joh. Pet. Faber.)

"8. If the King's-Evil must be taken away by causticks, there is no better medicine to take them away, than sublimated Arsenick; but you must have a care, that the parts near the Swelling do not Putrefie or Inflamm. (Guil. Fabricius.)

"9. An excellent Electuary to take away the King's-Evil is thus made: Take of the Bones of a Hen, the flesh whereof has been boyled off, dry them, and powder them. Take of this Powder and Seed of Sesamum each alike, as much as you will, with Honey make an Electuary. Take a drachm at a time Morning and Evening all the decrease of the Moon. (Rod. a Fonseca.)

"10. The use of the Powder of Sponge will cause it to decrease, if you drink as much as you can take upon a knife's point, in Cinnamon-Water. The sponge must not be burnt for then its Seminal Virtue is destroyed. (Grembs.)

"11. This is admirable for the King's-Evil, Throat Rupture, Parotides, and all hardness. Take the leaves of Cypress, neither the tenderest nor the hardest, reduce them to powder, sprinkle them with strong Wine, and burn them, till the Body of them turn to dreggs. Lay it upon the Scroffles or Rupture and the third day take the Medicine, you will find the Place contracted, which must be squeezed out with the Fingers. Let this Medicine be repeated, and on the Seventh or Ninth day at farthest the King's-Evil will be gone to a Miracle. (Hollerius.)

"12. Take of Root of Fern, Spleenwort, Dwarf-elder each 3 ounces, cut them and boyl them in the best Wine. then pour away the Wine, bruise the Roots, and add of live Sulphur 1 ounce, ashes of Cockle-shells, 2 drachms. With equal parts of Honey and Vinegar reduce them into the Form of a Cataplasm, lay it upon the Scroffles, it consumes them wonderfully. (Fr. Joel.)

"13. There is scarce any Plant of so great Power in softening and discussing Swellings in the King's-Evil, &c., as the bulb of Cornflag and Hogs-Lard outwardly applied. (Laurentbergius.)

"14. It has been found by experience, that burnt Allum powdered, if half a drachm of it have been given in Wine alone, or mixt with other discutient and drying Powders has done much good in this Case. (Platerus.)

"15. Root of Figwort eaten for 10 dayes every Morning fasting cures the King's-Evil." (Arnold Villanovanus.)

Dr. James, the contemporary and personal friend of Dr. Samuel Johnson, published his great *Medical Dictionary* in 1745, ten years before the appearance of the work of the great lexicographer. I may mention, in passing, that "Rough Johnson" is known to have contributed very largely to the more purely literary items of this professional Encyclopadia, and that the idea of preparing his own great *English Dictionary* is said to have arisen while taking part in the work of his friend. James' *Dictionary* may be taken as a respectable criterion of the knowledge of the period, and especially of such subjects as that now before us, in the hazy and unsettled style of its science. The subject of the present communication is dealt with as follows:

"SCROPHULA.—The King's-Evil; from *Scrophæ*, a swine; because this Animal is said to be much subject to such a Disorder.

"Quincy remarks, that the Gout and the King's Evil agree in being frequent amongst Persons strong both in Body and Mind, who are hearty Feeders, and on other Accounts well and healthful; in this respect, however, considerably differing, that the Evil generally appears at three, four or five Years of Age: and dries away by that State of Manhood that the Gout gives its first Warnings of approach; though neither of these are without some Latitude of Exception. And as the Gout is owing to sharp Saline Humors, that are contracted by a particular way of living and favoured in their Accumulation by a peculiar Make of the Parts where they settle, upon the Declension of the natural strength, so this Disease seems owing to a hot, Sharp Humor, propagated a *Semine* from the Parent, in the first Formation discovering itself at an age, when certain Glands are fitted for its Reception, and disappearing when the digestive Powers have arrived to their greatest Strength.

"That Persons subject to the Evil do early show an uncommon Vivacity of Mind, and Forwardness of Understanding, is a Fact that all have experienced who have been accustomed to such Opportunities of Observation; as, also, that if the Distemper goes on without much Interruption from its natural Course, and dries away about the Age of Manhood, as it commonly does, such Persons are generally strong, and free from Distempers afterwards.

"That such a Humor can be derived from the Parent, is granted, perhaps, in more instances than when it is really so, and is likely to be yielded by many, more on the Score of a Vulgar Opinion, than for any true Notions of the Manner how such a Thing is possible: It may be, therefore, necessary to form some rational conceptions hereof, in order to judge what Disorders spring from such an Origin, and which not, because, without some Rules to determine by, Cases may be confounded and mistaken, from some Resemblance in their Appearance, which flow from very different Causes.

"To this Purpose, then, I cannot see what we have to do with the Philosophy of the Microscope, so far as it asserts the Semen to be animated before generation, because it seems not in any Manner to affect the Matter under Inquiry; but so far as we get any knowledge of the sensible and manifest Properties of that small Portion of Matter, from whence we boast the production of the finest Machines in the Creation, it appears to consist of a very subtle, active Salt, floating in a soft balsamic Vehicle; whereas, therefore, we can conceive what Consequences to the Economy already formed, may flow from an Excess or Defect in the more active Principles of such a Composition; so may we, by a Parity of Reason, conjecture, what must be the Result of every Deviation from the natural Standard in the same Principal before its Animation in the Matrix. Where, then, this Principle abounds with Heat and Pungency in the masculine Semen, it will not only irritate more frequently and more strongly to Venereal Embraces, but carry with it the same Qualities into the impregnated Ovum; and, without some uncommon Interruption or Contemperature from opposite Qualities, will increase in the growing Foetus, in Proportion to its Enlargement, and make a Part of that Constitution to which it gave Being, with the same Afflictions and Properties as it stood possessed of in the generating Semen.

"Hence it will be no difficult thing to imagine what a Condition the Off-Spring of such a Parent must be in: and how, sooner or later, in one or another Part, this

primitive Matter may show itself in a very troublesome, if not a very mischievous Manner, as the Circumstances of Life and Strength of the Constitution encourage or obstruct its Exertion, and the peculiar Configuration of the Glands favour or resist its Accumulation and Lodgment. And though in the Case immediately under Enquiry, it principally shows itself from a little Time after Birth to a State of Manhood, is probable from this Reason, that sooner, it is not in Quantity enough to be discernible, or is hindered from Exertion by the Laxity of the Parts and Viscidity of Humours, which is always more or less the Case of very young Children; but that when the parts have got some Degree of Firmness and have digested away the rough Humours, this hot, sharp Matter becomes Sensible to the fine Strainers and Membranes as it passes in the Course of Circulation, and it fixes upon them so as to occasion Pain, Inflammation, Swelling, and running Sores: But when, again, the Constitution takes another Turn and arrives to its utmost Vigour, the digestive Powers become able either to destroy its Pungency by Attrition and Comminution, to detach it off by some natural Outlet, most commonly the Glands of the Skin, or to lessen it, so much at least, in Quantity, that it flows with the ordinary Current without sensible Effect, and never afterwards appears, but in giving to the generating Principle the same bad Taint from whence it derived its Existence: and that even frequent Coition and Propagation shall vent and draw off a great deal of this Matter, to the Benefit of the Parent, and Detriment of Posterity, is not only probable, but almost demonstrable; because, during that Time of Life, and in Proportion to such Indulgence, the Parent is always the most free from it, and that during the Travail of a Woman with Child, before subject to such Humours, or any of the like Kind, she shall be entirely free from it then, though if the Issue survives the common Fate of Convulsions, a little more age seldom fails to discover when such a Mother had her temporary Relief.

"That the Distemper then under Consideration may be thus propagated, is not only out of Question from common experience, but the Manner of it may in some measure be conceived from these Hints and the Nature of the generating Matter. The same way of Thinking, also will suggest in what Circumstances a Person may fall into this Distemper without having to charge it upon Parents, or the Milk of a tainted Nurse, which, also, may possibly happen, tho', it is believed, very rarely; and that is from a Way of feeding, or any other Condition of living, that gives to the Mass of Humours an uncommon Heat and Sharpness, which in Time shall fix upon the same Parts, inflame and ulcerate them in the same Manner as that derived from a distemper'd Semen...

"The *Scrophula* or *Struma* is a hard glandulous Tumour, usually of the same Colour with the Skin, seated principally on the Sides of the Neck, about the Musculi Mastoidei, behind the Ears, and under the Chin; either more or less moveable, single of the conglobate Kind, or in Clusters of the conglomerate Kind; many Patients having been observed to have them contiguous from the Ear down to the Clavicle.

"Though the principal Seat of this Disease is in the Sides of the Neck, scarcely any part of the Body is exempted from it; and it affects either Glands, Muscles, Membranes, Tendons, Bones, or the Viscera.

"The Glands are the most remarkable Seat of this Distemper, and whenever the outward Glands appear

swelled, those of the Mesentery may be concluded to be so too, the Mesentery being usually the Part first attacked by this Malady....

"If the Strumæ have been long ulcerated, and are become sinuous and virulent; and if they lie near one another, they often find a communication to one another, though they appear distinct: In this Case the Lips grow callous, and the Ulcers corrosive, frequently sordid, and the Cure is not to be hoped so long as any one Cystis remains, or the Vessels that feed them; but if the Ulcerations be simple, the Cure is accordingly easy. Those who are seized with Struma in the Neck, after forty Years of Age, seldom recover, as they personally labour under great Obstructions, whence spring scorbutical Affections, Jaundice, Fainting, Vomiting, Loss of Appetite, Sometimes a Dropsy, and sometimes a Cough, in which case they die rabid."

"THE METHOD OF CURE.

"In the Cure three Things are required. (1.) A Regimen of Diet and the other Non-Naturals. (2.) Pharmacy or Internal Prescriptions. (3.) The Applications of Externals either to discuss, suppurate or extirpate the Glands.

"With respect to a Regimen of Diet, Regard ought to be had to the Constitution of the Patient, whether it be hot or cold, dry or moist, old or young, robust or delicate. If the Body be cold or moist, we generally suppose a Surfeit preceded, and Crudity to abound; in which case, Abstinence from Meat and Drink, or at least great moderation, is requisite. Their Diet ought to be moderately heating and drying, as Mutton, Kid, Rabbet, Pullet, Chicken, Partridge, Pheasant, Poltry, and the like, and these roasted, avoiding all Aliments which yield a gross phlegmatic Nourishment, such as Water-Fowl, Fish, especially those of Standing-Waters, Herbage, Cheese, all smoak'd, seasoned or dried Meats. Their Bread ought to be of Wheat, well-baked, and their Drink medicated Ale or Beer; Wine also is allowed, and water utterly forbidden.

"In hot and dry Constitutions tending to a Hectic, we allow a Diet of a more humid Nature, their Meat being boild with Lettice, Spinnage, Purslane, Wood-Sorrel, and the like; to some of these we dare scarce permit the eating of any Flesh, but rather a Milk-Diet, or Asses Milk; though Milk will not be always found agreeable; in which Case we prescribe medicated Broths. Pork is, by some, forbidden strumous people.

"Air is a great Help to the Cure, which ought to be mild and gentle, in cold Weather, heating and attenuating, and in the hot cooling. Exercise of Body ought to be enjoined, it being necessary to waste Superfluities. Sleeping in the Day is forbidden, unless where the Case is painful, to which it is an Anodyne. The Passions of the Mind ought to be moderated.

"The internal Prescriptions must be qualified according to the Habit of the Body. If it be cold and phlegmatic, abounding with gross viscous Humors, the prescriptions ought to be heating and attenuating. In plethoric Constitutions, the stronger Cathartics ought to be exhibited, or the milder often repeated. The Purgatives are, the Species Hieræ with Agaric, Diaturbeth, Pulvis Cornachini, Pilulæ Cochæ, à duobus, Rudii, De Hermodactylis, Alophanginæ, Imperiales, à Succino, Trochisci, Alhandal, Diagrydium, Resina Jalapii, and Mercurius Dulcis, and all those Medicines prescribed in the Lues Venerea.

"Alteratives are also usefully taken on those Days in

which the Patient does not purge. Among these a Decoction of the Woods claims a Pre-eminence; to which are added one or other of the Specifics, so called, such as the Roots of Fig-wort, Drop-wort, Devil's-bit, Soap-wort, Burdock; the Bark of the Walnut-tree; the Herbs, Rag-wort, Cranes-bill, Herb-Robert, the greater Calendine, Hound's Tongue, white Hore-hound, Fox-glove, and the like.

"In these Decoctions it is very common to put also a Lump of crude Antimony, of four Ounces or half a Pound Weight, grossly powdered and tied up in a Rag;....

"Besides these Liquors to be taken as a Diet, there are other Medicines, such as the diaphoretic Antimony, Bezoar Mineral, Æthiops Mineral, and Gum Guaiacum....

"The third Intention is performed by the application of Externals. 1. To the Tumours which we endeavour to resolve, or suppurate, or to extirpate. 2. To the Ulcers which are the Effect either of Suppuration or of Extirpation. In Tumours we shall begin with Emollients and Discussants, though it is no easy Work to resolve these Glands, if we consider the Stubbornness of the Matter, and its being contained within a Cystis; yet in some soft delicate Bodies the milder sort of Glands, which are not too much indurated, frequently resolve. The *Emplastrum de Ranis cum Mercuris* is frequently applied for this End, as also that of the Gums, *Amm-niscum*, *Galbanum*, *Bdellium*, to which crude Mercury may be added, as it is the New dispensatory.... *Zacutus*.... says he never used the following Ointment without success. Take of the Root of Great Bryony, plump and round, half a Pound: cut it into small Pieces, and fry it with three pounds of recent Olive Oil, till they become dry and wasted; Strain it, and add of Turpentine of Fir, half a Pound; Yellow Wax, five Ounces; remove it from the Fire, and make it into a viscid Ointment.

"The Herb Goose-Grass or Clivers, beat up with Lard, and the Strumæ therewith annointed, discusses the same, while the distilled Water of the whole Plant lends further Assistance. The root of Smallage is recommended by Mr. Ray for the like Use. *Crollius* as highly extols the Lesser Celandine or Pilewort, whose Roots, he says, are a Kind of Specific in this Disorder....

"*Etmuller* and Mr. Ray recommended the *Pulvis Cyani* or Tincture of its Flowers; others the *Radix Cynoglossi*, or Root of Hound's Tongue, drinking the Decoction of it, and applying it outwardly in Cataplasms. But the *Folium Digitalis*, or Leaf of Fox Glove, pounded and applied to the Strumæ, or the Ointment of its Juice, is highly esteemed by the Botanists. Dr. Bates's Preparation of this Ointment stand thus:

"Take of May Butter, three Pounds: fresh leaves of Foxglove, bruised as much as you can mix with the Butter; expose them to the Sun thirty Days; then boil them till the Leaves become curled, and let a strong Expression be made.

"This seems to be the same with that used by Mr. Wiseman, which he calls the *Valentia Digitalis*, having undergone a repeated Infusion of fresh Leaves, by which the same is farther impregnated with the Virtues of the Plant. *Helmont* praises the spongy or hairy Excrescence, growing out of the Canker-Rose, the Powder being taken to half a Dram mixed with Sugar.

"The *Radix Rusci* or Root of Butcher's Broom, in fine Powder, given to a Dram every morning in White-Wine, especially if an equal Proportion of those of

Flipendula or Scrophularia be added, and administered in the like Dose, is praised by *Etmuller*, as is the Rue-leaved Whitlow-Grass by Mr. *Boyle*. *Arnoldus Villanovanus* says, that the fresh Root of Scrophularia, eaten for ten Morning fasting, certainly cures the King's-Evil.

"When the Glands discuss not, but begin to enflame, a Suppuration will be the Consequence; to promote which, let the stronger emollient Suppuratives be applied, as the Roots of White Lillies, Bryony, Marshmallows, Sow-Bread, wild Cucumbers, to which may be added, fat Figs, and Pigeons Dung; and if the Progress be very slow, for stirring up the sluggish Humour, and rousing its Heat, the Root of Pellitory of Spain, and the seeds of Staves-Acre and Mustard. To promote the Suppuration, it is, also, common to pinch them hard; and some People in the Country thrust a Thorn into them, which excites Inflammation and disposes them to suppurate. Care must be taken to endeavor a perfect Concoction; for if they are opened while any Part of the Gland is hard it will encrease and occasion a Necessity of eradicating it or of leaving the Cure imperfect."

[To be concluded.]

DIGEST OF MEDICAL LITERATURE

CLINICAL MEDICINE.

DAVID RIESMAN A. O. J. KELLY
NORMAN B. GWYN BERNARD KOHN
HELEN MURPHY

SERUM ANTIDIPHTHERICUM; ANTIDIPHTHERIC SERUM; DIPHTHERIA ANTITOXIN: A REVIEW.

BY

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Diphtheria antitoxin having been made official by the United States Pharmacopeia, now is the time to review the literature on the subject for revising textbooks, etc. The following data were collected in connection with revision work for my personal use and may prove of service to others desiring the same information for convenient reference.

It is my purpose to consider diphtheria antitoxin from the materia medica point of view. Much of the knowledge of modern materia medica products can only be obtained by gleaning it from a large amount of therapeutic literature relating to the diseases for which the products are employed. Physicians desiring to classify the information in regard to diphtheria antitoxin under that head will appreciate this compilation.

The following information has been collected from a large number of sources, including the United States Pharmacopeia, the textbooks on materia medica and therapeutics, papers appearing in medical journals, editorials in the same, and personal letters addressed to boards of health, hospitals, dispensaries, etc.

I have treated of the methods of manufacturing and dispensing the serum somewhat at length for the reason that I find the profession does not always appreciate the amount of technical skill and care required in its pro-

duction and the expense involved. Physicians generally would find it to their advantage to familiarize themselves more thoroughly regarding the methods of preparing drugs for therapeutic use, for success or failure often depends on the preparation used. There was, at one time, a great difference in antitoxins, as will be noted by consulting Public Health, Vol. I, No. 3, *Boston Medical and Surgical Journal*, Vol. cxxxiv, No. 17, and the *Medical News*, Dec. 19, 1896. While the improvements in technic and the adoption of a common standard established by the United States Public Health and Marine-Hospital Service have minimized the difference between the different brands of antidiphtheric serums on the market, nothing can take the place of special skill and care; so there will always be reasons for discrimination in prescribing.

I am indebted to the H. K. Mulford Company for much of my information on the subject of preparing antidiphtheric serum.

My reason for presenting much of what I have written in quiz form is because that in the form of questions and answers condensation can be secured without dryness.

As regards the efficacy of antitoxin, the *Medical News*, Oct. 9, 1904, says: "There are very few physicians now, and fortunately the number is growing even fewer, who are not fully convinced of the efficacy of diphtheria antitoxin for the treatment of what used to be considered the most fatal of children's diseases."

As stated by Prof. Wm. H. Thompson, M.D., LL.D.,¹ in his discussion on diphtheria antitoxin at the New York Academy of Medicine, "the verdict about any alleged remedy must depend upon the findings of a jury whose members should not only be competent, but also so numerous and of such difference in locality and nationality that all personal or local influences can be safely left out of account."

The antitoxin treatment of diphtheria came into use in the year 1895.

At the time of the discussion of the subject by the Academy, diphtheria antitoxin had been on trial about a year and a half, with reports upon it coming from scientific observers both in hospital and private practice in all parts of the world. Already it had reduced the mortality from diphtheria in the localities where it was being used fully one-half. But it had its detractors among men eminent in the profession, so the Academy considered it quite necessary that its merits should be impartially discussed by men of equal professional eminence. The testimony brought before the Academy was overwhelmingly in its favor.

And this favorable testimony from all over the world has been steadily increasing, and untoward results claimed for it by its detractors have proved to be due to other causes than antitoxin. So the professional verdict is now unanimous, and the discovery of the antitoxin treatment of diphtheria stands alongside the discovery of vaccination for smallpox as a triumph of scientific medicines.

As before stated, diphtheria antitoxin has been made official by the United States Pharmacopeia. The eighth revision of that book of standards became official September 1, 1905. Physicians generally should familiarize themselves with its contents. Therefore the first questions cover information to be found in the eighth revision of the United States Pharmacopeia.

What is the official Latin title for diphtheria antitoxin? The official Latin title is *Serum Antidiphthericum*. *What are the official English titles?* The official English titles are *Antidiphtheric Serum* and *Diphtheria Antitoxin*.

What is the official definition? The official definition is a fluid separated from the coagulated blood of a horse,

¹ "How the Facts About the Antitoxin Treatment of Diphtheria Should be Estimated." By W. H. Thompson, M.D., LL.D. Read at the Discussion of the New York Academy of Medicine, June 4, 1896, of the paper of Dr. J. E. Winters.

Equus Caballus, Linné, immunized by the inoculation of diphtheria toxin.

How does the United States Pharmacopeia direct that it should be kept? In sealed glass containers in a dark place, at temperatures between 4.5° C. and 15° C. (40° F. and 59° F.).

What is the appearance of diphtheria antitoxin? The Pharmacopeia describes it as a yellowish-brown, transparent or slightly turbid liquid, odorless, or having a slight odor, due to the presence of the antiseptic used as a preservative.

What is its specific gravity? 1,025 to 1,040 at 25° C. (77° F.).

How long does diphtheria antitoxin keep? The Pharmacopeia states that diphtheria antitoxin gradually loses its antitoxic power, the loss in one year varying between 10% and 30%.

How should antidiphtheric serum be labeled? The Pharmacopeia directs that each container should be furnished with a label or statement, giving the strength of the antidiphtheric serum, expressed in antitoxic units, the name and percentage by volume of the antiseptic used for the preservation of the liquid (if such be used), the date when the antidiphtheric serum was last tested, and the date beyond which it will not have the strength indicated on the label or statement.

How long will antidiphtheric serum keep and remain suitable for therapeutic use? After a year the strength is uncertain, and there would be considerable risk of failure incurred in having a serum dispensed by the druggist or used by the physician that does not contain at least the number of units claimed on the package.

How do the manufacturers meet this difficulty? By adopting a system of exchange whereby the druggists may always have fresh serum on hand for dispensing.

STANDARDIZATION OF ANTITOXIN.

What is the standard of strength directed by the United States Pharmacopeia? The standard of strength, expressed in units of antitoxic power, should be that approved or established by the United States Public Health and Marine-Hospital Service.¹

What is the unit of antitoxin power? A unit of antitoxin is a standard of measuring the life-saving value of the serum, like an ampere for measuring the power of electricity.

DIPHTHERIA TOXIN vs. DIPHTHERIA ANTITOXIN.

What is diphtheria toxin? Diphtheria toxin is a peculiar virulent poison generated by a specific germ known as the Klebs-Löffler bacillus.

What is the cause of diphtheria? Klebs-Löffler bacillus.

How did this bacillus get its name? The bacillus was discovered by Klebs in 1883 and isolated the following year by Löffler.

Is anything known concerning the chemical composition of diphtheria toxin? According to the theory of Ehrlich there are three principal compounds in the substance we know as diphtheria toxin. They are toxin, toxoid, and toxone.

What is the effect on animals when diphtheria toxin is injected into the system? The toxin is the active poisonous constituent. It causes the high fever, prostration, cloudy swelling, and, later, fatty degeneration of the heart muscle, kidneys, cells, etc. When death occurs acutely it is the toxin which is responsible. Toxone attacks the nerve cells and is generally slower in its action than toxin. An animal may die of paralysis as late as one month after the injection of the toxic fluid. Toxoid is not poisonous in itself, but it is capable of neutralizing antitoxin; indeed, it has more avidity for the antitoxin than does the toxin itself; it is probably not formed

within the body but is toxin which has lost its poisonous properties. There is least affinity between the toxin and antitoxin.

Can these symptoms be produced in animals by the injection of antitoxin? They cannot.

What do these facts teach? 1. It is vitally important in the treatment of diphtheria to administer antitoxin early, and in sufficient doses completely to neutralize the toxin in the system elaborated by the diphtheria bacilli. 2. The disturbances of the heart and kidneys are due entirely to the diphtheria toxin and not to the antitoxin. 3. The degeneration of the nervous system is due to the toxone. 4. Paralysis is due to the toxone. 5. That early use of antitoxin neutralizes the poison and precludes the possibility of ill-effects if given in sufficient doses to neutralize it completely.

Are these teachings borne out by clinical experience? Yes. All degenerations not only attack the tissues at the point of invasion, but elsewhere, especially the kidneys, heart, and nerves; constitutional symptoms are marked early in the case, and unless antitoxin is given in full doses before the fourth day the chances of recovery are very seriously lessened.

Is it, then, useless to administer antitoxin late in the case? No, but extra large doses are required. (See under "Dose of Antitoxin.")

PREPARATION OF DIPHTHERIA ANTITOXIN.

How is diphtheria antitoxin prepared? The first step in the preparation of diphtheria antitoxin is to obtain a pure virulent culture of the diphtheria germ. Large flasks of peptone bouillon are then inoculated with the germs, and grown for five to seven days in a separate incubating room. During this period a large amount of virulent diphtheria toxin is formed. Trikresol is then added to kill the bacilli, which are separated from the toxic fluid by the Berkefeld filter. The toxin is now standardized by the inoculation of graduated quantities into guineapigs of known body-weights, to establish the minimum lethal dose for a guineapig weighing 250 gm. (8 oz.). This minimum lethal dose is the smallest amount of toxin which will prove fatal to the guineapig within a definite period of time.

What is the next step? The next step in the preparation of the antitoxin is the injection of the toxin into the horse. A hypodermic injection of a very small quantity is first given, which dose is gradually increased and repeated every few days. The horse gradually acquires a tolerance (immunity) to the toxin and his blood and tissue juices develop antitoxic power. After the horse has been treated for several months and is able to resist large quantities of toxin, a trial bleeding is taken. This is allowed to clot and the watery part (the serum) is tested to ascertain whether or not it contains sufficient antitoxin to make a bleeding valuable.

What then? If the blood-serum of the horse contains a certain number of units per cubic centimeter, it is an indication that the horse is ready to be bled. If it does not contain sufficient antitoxin the treatment is continued for a longer time, trial bleedings being taken at intervals, until it is determined either that he is ready for a bleeding, or is of no value for the production of diphtheria antitoxin.

What happens to the horse after a full "bleeding" has been taken? He is allowed to rest a few days, then the toxin treatment is continued.

Does the horse contract diphtheria by these injections? No. The horse does not contract diphtheria, since that disease can be produced only by the living diphtheria bacilli. He is injected with toxin from which all the bacilli have been eliminated.

What effects do these injections have upon the health of the horse? During the time of treatment the horse's temperature and general health are continuously watched, and if the reaction to the toxin is too violent,

¹ See third paragraph under heading Testing Antitoxic Value of the Serum.

the dose is decreased and subsequently increased as immunity becomes established.

WHY THE HORSE IS EMPLOYED.

Why is the horse selected for the production of diphtheria serum? Because it is comparatively free from disease, enjoys a high degree of natural immunity to diphtheria, and yields a fine quality of serum in considerable quantities.

How should the horse be selected? The horse must be robust and in perfect health. Each horse is first injected with mallein, the agent which produces reaction, revealing even the microscopic presence of glanders, and is kept constantly immunized against tetanus with tetanus antitoxin.

How are the horses kept? Each horse is kept in a separate stall, provided with individual water-supply, ventilation, and drainage.

Will any healthy horse do for the production of the serum? No. Very many horses are discarded even after they have been admitted in perfect health and passed all the required orders because they do not produce antitoxin of the required strength.

BLEEDING THE HORSE TO OBTAIN THE ANTITOXIN.

How is the horse prepared for the bleeding? Before the horse is led into the operating-room he is prepared for the operation in an adjoining room, where evidences of the stable are washed from his feet and legs, then covered with a sterile sheet which has been soaked in a 1 to 1,000 mercuric chlorid solution. These precautions minimize the danger from the dirt and germs which otherwise would be carried into the operating-room.

Describe the operating-room. The operating-room should be in an entirely separate building from the stables and similar in construction to the operating-rooms found in the most modern and best equipped hospitals. The floors and walls should be cement with porcelain finish and washed down before the operation is commenced to prevent the possibility of particles of dust floating in the air.

How is the operator prepared? The same care and precaution are exacted as are practised by the surgeon in the most delicate operation upon a human being. Everything connected with the process, including instruments, vessels, and apparatus, is thoroughly sterilized by the most improved methods. During the operation no one is admitted to the operating-room except the veterinary surgeon and his assistant.

Describe the method of bleeding. A canula attached to a sterilized rubber tube is introduced into the jugular vein of the horse and the blood collected in a sterile parchment-covered jar.

What is then done with the blood? It is then transferred to the blood-room to allow the serum containing the antitoxin to separate from the hemoglobin from the contraction of the fibrin.

After the serum separates what is done with it? It is then transferred to sterile bottles in a room set aside for the serum work. A small quantity ($\frac{1}{10}$ of 1%) of a non-irritating antiseptic (trikresol) is added to prevent the possibility of contamination by careless use after the antitoxin has left the hands of the manufacturer. The addition of the antiseptic causes the precipitation of certain albuminoids which require filtering. This removes any particles that may be caused by the presence of the antiseptic, though in many serums the precipitation continues to a limited degree after filtration. This precipitate is of albuminoid substances and does not lessen nor change the antitoxic value of the serum.

TESTING THE ANTITOXIC VALUE OF THE SERUM.

What is the next step in preparing the serum? Testing to determine its antitoxic value.

What test is employed? The test of Ehrlich's, adopted by the United States Government, and now official in the United States Pharmacopeia.

How is the test applied? The Hygienic Laboratory of the United States Public Health and Marine-Hospital Service issues at intervals small quantities of a test antitoxin. The number of standard units contained in each cubic centimeter of this antitoxin is definitely stated. This is the standard used for gauging the strength of a toxin which has been set aside for use in testing. The amount of this test toxin, which when mixed with exactly one unit of standard antitoxin will kill a guinea-pig of 250 gm. weight on just the fourth day, is called the test dose. The test dose of this special toxin is measured into an injecting syringe; the antitoxin is next measured into the syringe, the mixture is shaken and allowed to stand for at least 15 minutes. Both toxin and antitoxin had been diluted so that the desired quantity of each was represented by 1 cc. At the end of the period 2 cc. of the mixture are injected subcutaneously into the guinea-pig; then 2 cc. of normal saline solution are put into the syringe to wash it out, and this is also injected without removing the needle. This method, using a separate syringe for each injection, renders the test extremely accurate.

In the calculation of the amount of antitoxin to be used for the test, the number of units per cubic centimeter is taken as the basis. For instance, suppose we wish to test a certain antitoxin for 400 units. This means each cubic centimeter contains 400 units, or in $\frac{1}{400}$ of a cubic centimeter there would be one unit. This, then, is the amount of this antitoxin to be mixed with the test dose of toxin. Suppose the pig should live for four days after having received this mixture, another pig would receive $\frac{1}{400}$ cc. of the antitoxin, or if the first pig had died on or before the fourth day, the second pig would receive $\frac{1}{800}$ cc. This scheme is carried out until the smallest quantity of antitoxin which will save the life of the guinea-pig for four days is determined. The number of times that fraction is contained in "one" will equal the unit value of that antitoxin per cubic centimeter. The guinea-pigs weigh about 250 gm.

Is the antiseptic added before or after this test is made? The antiseptic is added sometimes before and sometimes after the test is made. There is not the slightest appreciable difference.

What does this disprove? It completely disproves the claim advanced by those opposed to serum therapy, that antitoxin may derive its therapeutic value from the presence of the antiseptic contained therein, a fallacy which has cost thousands of lives.

Does the serum undergo any test to ascertain whether or not it is entirely free from bacteria? Yes; a glass vessel so constructed that the various parts of it favor the growth of both aerobic and anaerobic bacteria is used for this purpose. Into this vessel containing about 200 cc. of sterile bouillon there is drawn an equal quantity of antitoxin; thus, the antiseptic in the serum is diluted, and the growth of any bacterium which might be present is favored. The vessel is then placed in the incubator for six days. At the end of this time the contents are examined for bacteria and 5 cc. injected into a guinea-pig. The guinea-pig is watched for the appearance of untoward symptoms for at least seven days. This is an extremely rigid test, but no serum should be used for the treatment of diseases until it has been subjected to this or a similar examination.

READY FOR THE MARKET.

After the serum is tested for antitoxin strength, what is then done with it? The serum is put up in sealed glass containers ready for the market.

In what kind of containers is diphtheric serum preferably marketed? In aseptic hermetically sealed glass syringes, provided with finger-rests that permit inject-

ing the serum with one hand, with a rubber plug which serves to retain the serum in the barrel of the syringe and act as a washer when the plunger is pressed against it to expel the antitoxin, and with a hypodermic needle, preferably connected with the syringe by a short, sterile rubber tube.

Why is the sterile rubber tube provided? To act as a safeguard in the operation of injecting the serum. The flexible tube prevents tearing the flesh of the patient with the needle or breaking the point of the syringe should the patient struggle during the injection, and if larger quantities of antitoxin are needed than can be furnished in one syringe, the syringe can be detached and another one substituted without withdrawing the needle.

METHOD OF ADMINISTRATION.

Where is the best location to give the injection? Any part of the body where the skin is loose may be selected. The best place is between the scapulas, since the patient cannot witness the injection, and is, therefore, less likely to be frightened.

Why should precautions be taken to avoid fright? Because in diphtheria the heart is always affected by the toxins of the disease, and care must be exercised to prevent excitement.

How should the site of injection be prepared for the operation? By thorough cleansing with warm water and soap, after which a 5% solution of phenol (carbolic acid) should be applied; the latter produces a degree of local anesthesia which tends to overcome the pain of puncture by the needle.

DOSE OF ANTITOXIN.

What is the average curative dose of antitoxin given by the United States Pharmacopeia? Three thousand units. The immunizing dose given by the Pharmacopeia is 500 units, but many authorities hold that 1,000 units should invariably be given.

What is meant by an immunizing dose of antitoxin? The transfer of sufficient antitoxin to an individual exposed to the contagion of diphtheria to protect against infection.

What is meant by a curative dose? The administration of sufficient antitoxin to one who has contracted diphtheria to neutralize completely the specific poison produced within the system.

CURATIVE DOSE.

How much antitoxin should be given as a curative dose? A curative dose of antitoxin should never contain less than 2,000 units. The United States Pharmacopeia gives as the average dose 3,000 units.

Why should this larger dose be given? Laboratory experiments prove conclusively that animals receiving an insufficient amount of antitoxin to neutralize the toxin of diphtheria die as surely as animals receiving no antitoxin; and further, we know from the constitution of the diphtheria poison that while the toxin itself may have been neutralized the toxone may not have been; and although a patient may have apparently recovered and all symptoms disappeared, death by paralysis may occur many days later.

Is the relation between the production of toxin and toxone always the same? No. Every physician has noted the fact that certain epidemics of diphtheria (this is true also of practically all contagious diseases) bear features which are peculiar and characteristic. This year the temperature (fever) may be particularly high, another year there may have been a large proportion of kidney complications, and so on. In like manner the "strain" of germ, causing a certain child to be ill, may produce very little toxone but a very strong toxin; this child will be promptly relieved by the antitoxin and

with a relatively small dose make an uneventful recovery. Another child has very few subjective symptoms, it can scarcely be kept in bed; a dose of antitoxin is injected and apparently the trouble is over; but perhaps a week later a gasp is heard and the child dies suddenly. The toxone had been elaborated out of proportion to the toxin, and because the latter had greater affinity for the antitoxin the toxone was left unchanged. The only way to overcome the danger is to give large doses of antitoxin.

Is it possible to determine the virulence and the amount of toxin in the system? No.

How then can the proper dosage of antitoxin be determined? The only safe rule is to give sufficient antitoxin to produce the following characteristic reactions: When you have given enough antitoxin the membrane shrivels, the odor becomes less fetid, the pulse becomes stronger, and the general condition of the patient is improved.

If these favorable symptoms do not occur, what should you do? Until all these conditions are observed you have not given sufficient antitoxin and repeated injections of double the initial dose should be made every six or eight hours until the desired results are manifested.

What other factors determine the amount of antitoxin to give as a curative dose? The duration of the disease when first seen and the proportion and the amount and location of the exudate.

State a general rule for amount of dose based on the duration of the disease when first seen. Kerley¹ says patients seen on the second day of the disease should receive 3,000 units regardless of the age; after the third day 5,000 units should be given as the initial dose, to be repeated if marked improvement is not positive within four to six hours. One child may require 3,000 units, another 30,000.

State a general rule fixing the dose by the amount and location of the exudate. Dr. Royer,² of the Philadelphia Municipal Hospital, recommends for tonsillar exudate (single), 2,500 units; purely tonsillar (double), 5,000 units; tonsillar exudate with pillars and uvula or pharynx involved, 7,500 to 10,000 units.

DOSAGE OF ANTITOXIN IN PHARYNGEAL DIPHThERIA.

What may be regarded as the consensus of opinion regarding the dosage in pharyngeal diphtheria? In an ordinary case of diphtheria, such as faucial, tonsillar, etc., when the serum treatment has been begun early, never administer less than 3,000 units. If the disease has progressed for some time and the membrane is extensive, or is disposed to spread, give at least 4,000 units as a first injection.

DOSAGE OF ANTITOXIN IN LARYNGEAL DIPHThERIA.

What is the proper dosage in laryngeal diphtheria? In all cases of laryngeal diphtheria (membranous croup) never administer less than 4,000 units. If the antitoxin is given late and the symptoms of asphyxia seem imminent, 8,000 units should be promptly administered and intubation immediately performed. McCollom³ recommends 4,000, 6,000, or 8,000 units, which, if given early, affords relief within 24 hours.

How often should the dose be repeated? The dose should be repeated in each type of the disease in from

¹ "How and When to Use Antitoxin": C. G. Kerley, M.D., New York State Jour. Med., May, 1905.

² Taken from an abstract of a paper read before the Philadelphia County Medical Society by B. Franklin Royer, M.D., January 11, 1905. The abstract appears in the Jour. of the Amer. Med. Assn., February 18, 1905, p. 568.

³ "The Experience of Nine Years in the Treatment of Diphtheria with Antitoxin." By John N. McCollom, M.D., Physician for Infectious Diseases, Boston City Hospital, etc.; Assistant Professor Contagious Diseases, Medical Department, Harvard University. Paper read at meeting of Boston Medical Library, March 8, 1905. Published in Boston Med. and Surg. Journal, May 25, 1905.

6 to 8 hours, depending upon the signs of improvement, and every 6 to 8 hours thereafter. When a large amount of exudate persists, a dose of 6,000 to 8,000 units should be given until a good part of the exudate has disappeared.

When should the dose be increased? If there is no marked improvement in the course of 6 to 8 hours, the dose should be doubled, and given every 6 or 8 hours. McCollom¹ says that when there is evidence of extension of the disease to the bronchi give 20,000, 30,000 or 40,000 units. When the initial dose has been less than 3,000 units, administer three times the quantity of the initial dose for the second injection.

Is there no danger from large doses? No maximum dose limit has been discovered. The danger is in giving too small doses to neutralize the toxins which are rapidly elaborated by the bacilli; 20,000 units have been given as an initial dose, and 100,000 units administered in treating the same patient, saving life that would probably otherwise have been lost. No case of diphtheria should be considered hopeless.

IMPORTANCE OF EARLY FULL DOSES.

Why should diphtheria antitoxin be given in full doses early in the case? In all suspected cases it is important that antitoxin be administered without waiting for bacteriologic examination. Particularly is this so in croup cases; antitoxin should be given in every instance, without a moment's delay. A culture should be taken to confirm diagnosis, but never await bacteriologic results before using antitoxin. As already stated, in treating a patient having diphtheria, it is necessary to give enough antitoxin completely to neutralize the toxin of diphtheria, since laboratory experiments prove conclusively that animals receiving an insufficient amount of antitoxin to neutralize the toxin of diphtheria die as surely as animals receiving no antitoxin. Hence in a patient ill with diphtheria, since it is impossible to determine the virulence and the amount of toxin that have been elaborated by the diphtheria germs, the only safe rule is to give sufficient antitoxin to arrest the disease at once.

What is the rate of mortality resulting from delay in giving antitoxin? When antitoxin is given on the first day of the disease, the mortality does not exceed 0.34%; when not given until the second day the mortality is 1.46%; third day, 3.24%; fourth day, 10.8%; later than the fourth day, 23.1%.² Dr. Jules Comby,³ the famous pediatricist of Paris, says that the use of diphtheria antitoxin decreases the mortality of diphtheria 75% (three-fourths), and if employed during the first 48 hours abolishes the mortality entirely. J. S. Billings, Jr.,⁴ of the New York Board of Health, lost only 85 cases in 1,702 cases treated with diphtheria antitoxin on the first day or less than 5%, and this included the cases moribund when the injection was given.

Zahorsky⁵ obtained data from a number of physicians in St. Louis and found a mortality of only 1.5% in 1,610 cases; and one of the physicians was of the opinion that no patient with diphtheria should die if antitoxin is used in a proper manner, viz., in full doses early in the case.

How many doses should usually be given in a case? When treated early comparatively few patients require the second dose if the initial dose is properly graded. In later cases, when the initial dose is well graded to the

severity of the case, few patients will require more than two doses.

EFFECT OF AGE ON DOSAGE.

Does the dose of diphtheria antitoxin depend upon the age of the patient? The *Medical News*¹ says the question of dosage does not depend so much on the age of the child as on the severity of the symptoms. Even for an infant, if there are threatening symptoms of extensive nasal or laryngeal involvement, 5,000 antitoxic units should be given at once. Repetition of the dose depends entirely upon the effect that is secured. If there is a drop in temperature, relief of breathing, a quieter pulse and generally a more comfortable condition, especially if the membrane assumes a granular appearance, and begins to disintegrate or clear up, the dose need not be repeated. If these favorable changes are not noted beyond the usual time for repeating the dose, it means that the toxins are not neutralized. If in doubt, when there has been but a partial reaction and only a slight remission of symptoms, it is better to be sure than sorry, and repeat the dose. Failure to do so means the assumption of an undue responsibility on the part of the physician.

How early in life has diphtheria antitoxin been given? Dr. A. Seibert,² of New York, reported a number of cases of diphtheria in which the patients were successfully treated by him with antitoxin, the youngest being but 7 weeks old. Dr. H. H. Whitten, of Peoria, Ill., in a private communication, states that he used antitoxin as an immunizing agent in a baby 24 hours old. In croup cases an injection should be given without a moment's delay, under all circumstances, and at every age, and a culture taken at the same time.³

CONTRAINDICATIONS.

Are there any contraindications to giving diphtheria antitoxin? There are no contraindications to the use of antitoxin in the presence of diphtheria symptoms.

IMMUNIZING DOSE.

What is meant by an immunizing dose of diphtheria antitoxin? As already stated, an immunizing dose of diphtheria antitoxin is a dose sufficiently large to protect against diphtheria infection.

How large a dose is considered sufficient? The United States Pharmacopeia gives 500 units, but many authorities now consider that insufficient, and recommend 1,000 units for adults.

How long does the immunity continue? For 3 or 4 weeks.⁴

Is the protection absolute? Yes, except when disease has already obtained a foothold. Under such circumstances the antitoxin restrains the severity of the attack.

What rules should be followed in regard to employing prophylactic or immunizing doses of diphtheria antitoxin? 1. In families in which diphtheria has appeared, the entire household should be immunized. If this be done the danger of spreading is removed and the necessity of isolation avoided. 2. In institutions for children, where diphtheria is liable to break out at any time, it has been found possible to avoid this by the administration of immunizing doses at intervals of about 4 months. When diphtheria has appeared, this course promptly checks its spread. 3. A similar rule applies to schools in which diphtheria has developed. By promptly immunizing the entire school the necessity for closing the school to prevent the spread of diphtheria is obviated.

It has been claimed that in spite of the remarkable

¹ See paper just quoted.

² Bulletin Chicago Health Dept., Feb. 13, 1904, *American Medicine*, March 5, 1904, p. 377.

³ "Serotherapy in Diphtheria." By Jules Comby, M.D. Read before the Fourteenth International Medical Congress. Abstract in Jour. A. M. A., May 9, 1903.

⁴ "The Administration of Antitoxin in Diphtheria by the New York Department of Health During 1902" By J. S. Billings, Jr., M.D., N. Y. Med. Journal, Dec. 12, 1902.

⁵ "The Mortality of Diphtheria in Private Practice under the Antitoxin Treatment." By John Zahorsky, M.D., Medical News, Dec. 5, 1903.

¹ Editorial in Medical News, Oct. 29, 1904.

² Arch. Ped., Feb., 1905, Abs. Jour. Am. Med. Assn., March 11, 1905.

³ Nothnagel's Encyclopedia of Practical Medicine.

⁴ Wesener. Münchener med. Wochenschrift, No. 12, March 21, 1905.

decrease in the mortality in cases of diphtheria since the advent of antitoxin, there is a wider distribution of the disease.

What suggestion has been made to check the spread of the disease? Bosanquet,¹ who notes the spread of diphtheria, suggests that the spread of the disease might possibly be checked by a larger prophylactic use of the remedy.

Have the results from the immunizing dose been sufficiently favorable to justify the profession urging the general adoption of diphtheria prophylaxis by antitoxin? Yes. In Baltimore,² for example, the Health Department reports that "very satisfactory results have been achieved in the prevention of diphtheria in infected houses. Three hundred and eighty-two children were immunized against diphtheria by 1,000 units of diphtheria antitoxin, and only one developed diphtheria," and in this case the disease had already commenced.

Is it not true that cases of reinfection occur; that is, a second case of diphtheria develops in the same house after fumigation following the primary case; and is it not true that cases have been reported of secondary infection occurring months after the primary case? Yes.

Then what is the use of trying to prevent the spread of diphtheria by giving immunizing doses of diphtheria antitoxin to persons exposed to the disease when the immunity lasts only three or four weeks, and would it not be necessary to repeat the dose in each case about once in two weeks to render the subject safe from secondary infection; and if so, is not the idea of diphtheria prophylaxis by immunizing doses of antitoxin impractical? These questions are all answered in a practical manner in the remarkable showing at Baltimore.³ Only one case in 382 immunizations occurred, or less than $\frac{1}{382}$ of 1%.

"SIDE EFFECTS" OF DIPHTHERIA ANTITOXIN.

All potent drugs have what the Germans call "side effects." *What are the side effects of diphtheric antitoxin?* Diphtheria antitoxin seems to be singularly free from "side effects." When its composition is considered this is not surprising. It is theoretically possible that the injection of serum from the blood of a horse into the blood of a human being might cause precipitins to form, but in the thousands of cases in which antitoxin has been used there has not occurred a sufficient number of "side effects" to warrant the conclusion that horse serum is entirely responsible. It is hard to believe that the presence in the blood of antitoxic bodies in excess could produce untoward symptoms.

Do not complications occur in diphtheria cases which may be attributed to the use of antitoxin? The complications of diphtheria are as follows: Parotitis, bronchopneumonia, especially in laryngeal cases. Atelectasis. Neuritis appears late or in convalescence. In the cardiac nerves it may cause sudden death, or a progressive heart weakness that may be fatal after a few hours, or a weak, slow pulse. Neuritic paralysis may attack the muscles of the soft palate, pharynx, larynx, eye, limbs or trunk. Recovery usually follows, but paralysis of the respiratory muscles may be fatal. Otitis media is common. Nephritis, late or in convalescence, is common. Often in nasal cases there are general symptoms of intense toxemia, typhoid state, very weak heart, skin rashes, sometimes bleeding and death in a week. The chief causes of death are laryngeal stenosis, septic intoxication or infection, heart failure and pneumonia.⁴ Now it

is certain that the number of these complications have greatly decreased since the advent of antitoxin. Whenever they do occur, it is fair to presume that they are due to diphtheria, not to antitoxin.

Does not diphtheria antitoxin sometimes produce heart paralysis? No. Diphtheria antitoxin never produces heart paralysis nor is it possible to affect the heart in the slightest degree, no matter how large doses may be given. Frequently the heart's action is better after antitoxin injections.

Is it not true that more cases of paralysis from diphtheria have been recorded since the advent of diphtheria antitoxin than before? It is true that more patients treated with antitoxin may develop paralysis, but it is due to the fact that the paralysis occurs only in the most severe cases, and such cases formerly resulted fatally, the patients not living long enough for paralysis to develop.

Does not urticaria occur in a certain proportion of patients treated with antitoxin? Skin rashes occur as complications of diphtheria and were noted long before the advent of diphtheria antitoxin. Scarlatina sometimes appears as the result of mixed infection, as is well known. Aside from these cases, it is true that a certain proportion of cases of urticaria occur from the injection of antitoxin (not due to the antitoxic bodies, but to the horse serum); in most of these cases the urticaria is of little consequence and soon disappears. Occasionally very severe rashes and joint pains are met, but of the millions of patients who have received antitoxin not a single death can be fairly attributed directly to it. It must be remembered that sudden death is not uncommon in diphtheria. By mixing these serums from several horses and by ripening the serum the number of the complications resulting from its use is lessened. There is no test known which will reveal an urticaria-producing tendency of a serum, and no physician should be surprised to see this result.

Is it not true that many cases develop heart and kidney affections and degeneration of the nervous system after the antitoxin treatment? Yes; but the heart and kidney affections and nerve degeneration are caused by the diphtheria toxin, not by the diphtheria antitoxin. The antitoxin is given to neutralize the toxin before it has time to produce these disastrous results. The earlier it is given the less likely do these results occur. If it is given in full doses at the beginning of the attack they do not occur at all. Experiments on animals have again and again demonstrated that diphtheria toxin causes heart and kidney affections and nerve degenerations, also that when the animals are injected with a mixture of toxin and antitoxin in proper proportions, to secure complete neutralization of the toxin by the antitoxin, no such evil results follow. Furthermore, a large number of patients in whom the heart, kidneys, and nervous system have been already seriously affected are now saved by antitoxin whom, before the advent of the antitoxin treatment, invariably died, and they add to the number of patients in whom the heart, kidneys, and the nervous system are affected, yet who ultimately recover because antitoxin was given, thus giving the impression that there are more cases of this sort since the advent of antitoxin than before.

Is there any other factor which may account for heart complications? Yes, these cases in which the heart muscle or the nervous system controlling the heart have become seriously affected by the diphtheria poison are in a precarious condition, and are especially liable to cardiac paralysis. It is absolutely necessary to keep such patients quiet for two or three weeks, and use extreme care in exercise until complete recovery takes place, or sudden paralysis of the heart may occur.

Finally, in this paper I have made no attempt to review the mortality statistics of diphtheria with and without diphtheria antitoxin, for the reason that I am accumulating data for another paper on that branch of the subject to be published later. It is my purpose to

¹ "Serums, Vaccines, and Toxines in Treatment and Diagnosis," William Cecil Bosanquet.

² Annual Report of the Sub-department of Health, Department Public Safety, 1904, p. 86.

³ Annual Report of the Sub-department of Health, Department Public Safety, 1904, p. 86.

⁴ "Essentials of the Practice of Medicine," William R. Williams, M.D., formerly Instructor in Medicine, etc., Cornell University.

have this paper reprinted and I then propose to send copies to leading authorities on the subject to secure further data on the points covered by the questions and answers here given, after which I expect to publish a revised edition in pamphlet form. The next paper on the decrease in mortality, etc., will be treated in the same manner and the revision will be finally incorporated in the pamphlet referred to. Copies of the finished pamphlet will then be furnished all those who have aided me in accumulating data as a slight return favor for courtesy rendered.

DERMATOLOGY

M. B. HARTZELL.

THE DELETERIOUS INFLUENCE OF LIGHT UPON THE SKIN.

BY

S. H. BROWN, M.D.

of Philadelphia.

To even the most casual reader of recent medical publications an arraignment of the various forms of light therapy on the defensive would occasion little or no surprise, so wellknown are the röntgen-ray burn, the Finsen-light reaction, and the ultraviolet-lamp erythema, etc. The serious results of these forms of therapy are common knowledge. But the question recently propounded before the medical world by J. N. Hyde, of Chicago (Amer. Jour. of Medical Sciences, January, 1906), as to whether actinic rays of light unfavorably influence not all but certain sensitive skins at definite ages of the body in the direction of the epitheliomatous metamorphosis opens up a field for thought that should be replete with interest, to say the least. The discussion of this phase of the subject was introduced by Hyde incident to a discourse on the etiology of xeroderma pigmentosum and cancerous changes in the integument.

As is well known to dermatologists, certain pigmentary affections progress steadily, but often slowly, toward epitheliomatous changes in the skin. These have been termed precancerous diseases and include xeroderma pigmentosum, keratosis senilis, Paget's disease, and others. The study of the histopathology of these affections at different stages of their course has thrown considerable light upon the early changes in cutaneous cancer, and it is, perhaps, to be expected that a further search into the etiology of the pigment changes would be no less interesting.

To understand the argument advanced by Hyde it is, perhaps, best to refer to some definition of this rare disease, xeroderma pigmentosum, and I take from a standard textbook (Stelwagon) the following: "A malignant disease, usually developing in early life, characterized primarily by freckle-like spots, especially on exposed surfaces, followed by telangiectases, atrophic changes, angiomatous and verrucous lesions, with increased pigmentary deposits, and finally, generally after some years, by epitheliomatous growths and fatal ending." As Hyde remarks, the special facilities it offers in the investigation of the etiology of epithelioma spring from the striking fact that the subjects of the disorder are of such a tender age. They have never been subjected to the accidents, exposures, habits, environment of adults, yet these changes mentioned progress to true epitheliomatous growths, a condition termed by Unna "presenile epitheliomatosis." Hyde further states that Unna and other investigators in this field point to the indisputable fact that this chain of morbid phenomena has its genesis in the weakened resistance of the skin of the young child to the more refrangible rays of the solar spectrum, the hyperemia and pigmentation being "simply different endeavors to paralyze the injurious influences of light." The surface of hyperemia acts like the red light of the photographer in the way of exclusion of the ultra-

violet and blue rays which are the effective agents in the production of the mischief. Absolute immunity might, therefore, be obtained by a generalized melanosis. According to Unna, the melanotic granules permeate the papillary layer and cutis, forming a black net directly communicating with the pigmented lymph spaces of the prickle layer.

Having proved to his own satisfaction, and it may be added to the satisfaction of many others, that the origin of this true juvenile carcinosis may be directly traced to the effect of the sun's rays, this observer proceeds to show that "carcinoma of the sailor's skin" as described by Unna suggests the operation of the same cause and in similar lines. These instances, he states, justify the inquiry whether all cutaneous cancers are not influenced in their origin and career by the actinic rays. The study of the action of light on the lower forms of both vegetable and animal life points to the probability that in man exposure to actinic rays produces a perceptible stimulation of the skin; and that this stimulation is effective in proportion to the special irritability of the integument on which it falls. This statement is borne out by experience with the various forms of light energy employed for therapeutic purposes. The chemical rays playing upon a sensitive and unprotected skin produce: (1) Hyperemia; (2) pigmentation; (3) atrophy; (4) cancerosis; the early changes being protective, acting in part as a screen against the actinic rays. It has also been observed by Ormsby that patients who burn in sunlight are burned by the röntgen rays and those who "tan" in sunlight "tan" under the rays. It will therefore be seen that the beneficent effect of radiant energy ceases when the effect extends beyond the limits of cell atrophy.

In the senile condition of the skin it is commonly noted that the prickle cells atrophy and pigment accumulates in and about the cells of the basal layer, independent of an exodus of erythrocytes from the vascular channels and degeneration of any outwandered organisms. These pigmentary deposits are doubtless due to an effort to protect the integument from the chemical rays, to which the subject of such pigmentation has become extraordinarily sensitive. The other changes incident to senility seem to confirm this statement. In this argument Hyde does not distinguish between the several varieties of cutaneous cancer thus produced, but considers that the essential fact in all is solely and simply that the epithelium is stimulated by the inconceivable rapid velocities of the actinic rays to a proliferation beyond its physiologic limits.

To further strengthen his contention, Hyde resorts to statistics furnished by the census reports of the United States for the year 1900. While the figures relating to cancer deal only with the fatal cases, it is interesting to note that the deathrate from cancer of the head, face, and neck (exposed portions of the body) was 8.7 higher in males than in females (1.8), and a large proportion of the deaths from cancer of all organs in the male subjects occurred among those given to outdoor occupations. It may be added that the figures bearing on cancer of the uterus and breast are omitted from this array of statistics for obvious reasons. Comparing the classes of laborers, Hyde finds that the agricultural toiler furnishes nine-tenths of the cancer mortality of this class; but it should also be remembered that this class of laborers outnumbered others by about one-fifth. Instances are cited to show that it is not the exposure to inclement weather or extremes of heat or cold that is responsible for cancerous growths of the skin, but rather the continued exposure to direct sunlight. Russian peasants, Eskimos, Egyptians, stokers, firemen, etc., are seldom affected with the disease. In the northern section of the United States the disease was more common in the white than in the colored population, showing that a pigmented condition of the rete furnishes a greater or less immunity against the actinic rays. The law seems to be that this immunity is proportioned to the diffuseness and uni-

formity of the staining, and the danger point is reached, in what is fortunately a minority of all skins, when the epitheliums are stimulated to furnish this immunity in a much less diffuse and uniform measure.

While considerable credit is undoubtedly due Hyde for bringing out this aspect of the properties of light on the skin, it would seem that he had gone to unnecessary trouble in presenting the overwhelming statistics which his article contains. Since no one doubts the agency of sunlight in the production of "freckles," and since no observer denies the epitheliomatous terminations of diseases such as xeroderma pigmentosum and keratosis senilis, the earliest changes in which diseases are circumscribed pigmentary deposits not unlike "freckles," it would seem that the connecting link could more easily be forged. The argument, however, is a good one, and the conclusions will doubtless tend to further other investigations along this line.

TREATMENT

SOLOMON SOLIS COHEN

L. F. APFLEMAN

E. LINDAUER

THE UNITED STATES PHARMACOPEIA.

BY

HORATIO C. WOOD, JR.

of Philadelphia.

It is a remarkable fact that to the majority of physicians the United States Pharmacopeia is a completely unknown book. The mass of the medical profession seems to hold the opinion that this work is published solely in the interests of the pharmacist; whereas the physician is, or should be, more interested in the Pharmacopeia than the apothecary. To the ignorance concerning the manner of preparation of the Pharmacopeia and of the contents of the Pharmacopeia is attributable to considerable extent the too common custom of prescribing proprietary drugs. It may, perhaps, not be amiss to bring to the notice of the medical profession the vast amount of labor and of expert knowledge which have been expended in the preparation of this work. The Pharmacopeia is compiled by a committee appointed by a convention representing various medical and pharmaceutical societies and colleges. It is a matter of interest, and perhaps of not general knowledge, that 12 members of the committee are medical graduates, about half of whom are active physicians with large general practices. It can hardly be considered, therefore, that the practical side of this book will be allowed to fall below the scientific standard which has been maintained. Beside the members of the medical profession who serve on the committee of revision, the publishers of the Pharmacopeia have been able to call on the services of men prominent in both medical and pharmaceutical professions for special lines of work; thus, at the time of his death Dr. Walter Reed, of the United States army, was chairman of a special committee upon diphtheria antitoxin. He is succeeded by Dr. Theobald Smith.

In the interval between the present Pharmacopeia and the previous one a considerable series of investigations were carried out for the revisers of this work, not only by pharmacists and medical pharmacologists, but also by clinicians. When it is remembered that this process of investigation and selection has been going on under more or less similar general lines for 70 years, and under the guidance of men who were as prominent in their times as the present revisers are today, it is remarkable that American physicians apparently fail to recognize that the remedial agents in the Pharmacopeia represent the most valuable drugs to be found in the world for the relief of any complaint within the reach of drugs. It would not be too strong a statement to say that if every physician in America was to prescribe no remedy

which was not in the Pharmacopeia that suffering humanity would be no loser, and if we excepted one or two unofficial drugs, the sick would be treated with vastly better results.

The compilers of the eighth revision of the United States Pharmacopeia have adopted a more liberal policy toward proprietary remedies than any of their predecessors, so that such substances as phenacetin, antipyrin, and aristol have found admission into the national standard. It is desirable to prescribe such remedies by their official names rather than by any trade name. He who prescribes lysol has no guarantee save the reputation of the manufacturers what sort of a mixture will be dispensed; but he who orders the Compound Solution of Cresol (*Liquor Cresolis Compositus*) knows that he is getting a solution containing 50% of cresol in a potassium soap which represents the composition of that which has so far been dispensed under the name of lysol. It is much more desirable to prescribe Thymol Iodid (*Thymolis Iodidum*) and know that the pharmacist must dispense a preparation whose purity is governed by chemical tests than to order aristol and receive a mixture of chalk and brick-dust.

One criticism, and probably the only fair criticism of the new Pharmacopeia, is on account of the cumbersome nature of a few of the names which have been adopted. Methylthioninæ Hydrochloridum seems a somewhat cumbersome title for methylene-blue, and a shorter, if chemically less exact term for trional than sulphonethylmethanum might have been found. One name which seems absurdly pedantic, and which has been continued from previous editions of the book, is that for the antidote to arsenic, which has been but slightly altered, now reading Ferri Hydroxidum cum Magnesii Oxido. A list of some of the additions to the eighth revision and their common or trade names may afford interesting information to those unfamiliar with this work:

COMMON NAME	OFFICIAL NAME
Antikamnia	Pulvis Acetanilidi Compositus
Antiphlogistin	Cataplasma Kaolini
Antipyrin	Antipyrina
Aristol	Thymolis Iodidum
Chloralamid	Chloralformamidum
Dermatol	Bismuthi Subgallas
Diphtheria antitoxin	Serum Antidiphthericum
Formalin	Liquor Formaldehydi
Formin	Hexamethylenamina
Iodol	Iodulum
Listerin	Liquor Antisepticus
Lysol	Liquor Chlori Compositus
Methylene-blue	Methylthioninæ Hydrochloridum
Pill of Aloes, Belladonna, and Strychnin	Pillule Laxativæ Compositæ
Saccharin	Benzosulphinidum
Sulfonal	Sulphonmethanum
Trional	Sulphonethylmethanum
Triple Elixir	Elixir Ferri, Quininae et Strychnis Phosphatum
Urotropin	Hexamethylenamina
Zinc Sulfofocarbonate	Zinci Phenolsulphonas

This list does not pretend to cover the new additions to the Pharmacopeia but only shows the spirit which has actuated the reviewers to make the book as generally useful as possible to the practitioner of medicine. This motive, and the scientific acumen which has been shown in the compilation of this work, should make it the most generally useful Pharmacopeia which this country has ever had. No physician who does not make himself thoroughly acquainted with this work can claim to be fulfilling his whole duty toward his patients and his profession.

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The New Series, Monthly, of American Medicine.

—Several weeks before the annual meeting of the American-Medicine Publishing Company, letters were sent to each of the voting stockholders notifying them that "business of unusual importance vitally affecting the future of *American Medicine*" would be considered at the meeting to be held February 13, 1906. The nature of the business and its relation to the financial interests of the company was indicated. The request for proxies and for personal attendance expressly asked a full statement on the part of each stockholder of his wishes in regard to the settlement of the questions involved. The interest of the stockholders was shown by the fact that out of a total of 50,505 votes there were represented at the meeting all save 5,445 votes, many of which were on account of stock held by the estates of deceased stockholders or standing in the names of nonresidents of this country. The questions at issue were discussed at length, with great freedom and fulness. There was an overwhelming sentiment in favor of certain changes of policy, and the reelected Directors of the Company were constituted a Committee to carry out certain changes within prescribed lines, under a resolution which in effect gave them full powers to act with regard to the Company and its journal in the manner and way they should deem to be the best interests of all concerned. It is as a part of their action that a New Series, Monthly, of *American Medicine* has been adopted, to be published at a popular subscription price, with no lowering of scientific, professional, or literary standards, but under conditions more in accord with recent developments in the profession. Further announcements will be made in the forthcoming first number of the New Series.

The cause of independent medical journalism is growing more important each year, and recognition of its value and necessity is becoming more general in the profession. The professionally-owned journal conducted in the interests of untrammelled opinion and speech, usually the sole medium of expression for the minorities through whom progress has always come, must necessarily encounter more difficulties than those periodicals which represent interests solely commercial, or are the mouthpieces of societies or other organizations, whether great or small. It is a matter for congratulation that there is always an emergence from such conditions into

greater freedom and progress. Experience has shown, moreover, that most of what is best worth while in the profession has been accomplished through the efforts of independent professional journals, though too frequently the final details of the measures they have inspired or inaugurated must be left to the publications which, representing large professional bodies and hence more powerful financially, deal naturally with measures which have become popularized and thus represent "majority" views. The profession is vitally concerned in the existence and power of its professionally-owned medical journals, and a large part of this interest must be directed, if it is foresighted and wise, to the cause of the independent medical journal. No efforts should be spared to make recognition of these facts more general. We earnestly bespeak not only a continuance but a marked increase of professional sympathy and support for the professionally-owned, independent journal, *American Medicine*, in its new development.

Manufactured foods deserve more attention from the profession than has usually been given to them. The extraordinary statements of the makers should be frowned upon in the interests of public health. Pediatricists have lessened the evils of baby foods which so often caused scurvy and other diseases of malnutrition. Some of these foods, by the way, being made mostly of starches and sugar, with a minimum of nitrogen, have undoubtedly caused unrecognized cases of nitrogen starvation. So many of the foods for invalids are merely stimulating extracts of beef, having no nutritive value whatever, that it is difficult to understand why the extravagant claims of their nutritive value are believed. The breakfast foods, which contain so much sugar and dextrin with their starch, are said to be followed by glycosuria now and then. The predigested carbohydrates are poured into the blood in such large amounts that they cannot be disposed of, so they drain off wasted. The mechanism for reducing the sugars is able to work on small amounts only. Is it not time, then, to get back to nature and simplify our dietetics? Is not the peasant with his bread and cheese, with a trifle of meat now and then, really better off than the Falstaff "with good capon lined"? An awakening to the need of a scientific dietetics may result in a simplification of our foods. The public certainly needs instruction, and there is a field for

much useful work by the profession. Plain oatmeal, stirabout, and crushed wheat were good enough for our healthy ancestors and should be for us. Fancy names given to them only cost us money and give no more nutriment. Therapeutically, also, there is much room for improvement, perhaps. A livelier interest in the uses of all foods will certainly lead to better knowledge of their uses for the sick.

Diseases carried by books of public libraries occupied the attention of the Paris Academy of Medicine, according to recent dispatches. It was reported that it had been experimentally determined that certain dried organisms retained vitality on the leaves of books, those of cholera two days, diphtheria 28 days, typhoid 50 days, and those of tuberculosis at least three months. It was stated that many cases of tuberculosis, particularly among students and clerks, were contracted from the books they handled. While not prepared to agree entirely with this statement, yet it is evident that library books can carry infection and are a source of some danger at least. We are notoriously careless in lending literature to invalids, even those with highly contagious diseases, and though the risk may be slight it is not wise to take it if avoidable. We do not sterilize money, yet no sensible man ever puts money in his mouth any more—it may have been in the mouth of a syphilitic a short time before. But it is well to think over the proposition to sterilize library books. The French have experimented in that line and find that the best of several methods tried was sterilization by 15 minutes' exposure to formaldehyd in hermetically sealed cases. Even if we do not adopt the suggestion, we need not stop patronizing the libraries, as it is extremely doubtful if we can bring in a true bill against the books very often. Even the organisms which resist drying are likely to drop off or be blown off.

Alcohol in diabetes is intimately bound up with the food question. Plant physiologists have about concluded that vegetable cells cannot utilize sugar delivered to them in the sap until they have first changed it into alcohol. There is some evidence that this is also the first step in the oxidation of sugars by animal cells. Analyses of freshly-killed animals invariably show traces of alcohol in the tissues. Should this prove to be true, it would be rational to feed alcohol to diabetics during the period that starches and sugars are withheld—indeed, some therapeutists advise it on empiric grounds or for the symptomatic treatment of the exhaustion. Unfortunately it is given in large doses which have narcotic effects, whereas it should be given in minute doses, highly diluted and very frequently, to imitate nature's method of delivering it to the cells in minute amounts all the time. This method has been tried with apparent benefit, and might tide the organism over the period during which it is building up its nervous control over the metabolism of the sugars. It is possibly the only disease in which alcohol can rationally be given as a food, now that there is such a reaction against giving it in conditions formerly considered essentially in need of alcohol. It is one way, at least, of saving the oxidation

of proteids at a time when they are needed so badly and likely to be burned up.

Another life insurance graft has been unearthed, though the public has had but a glimpse of its ugly face. It is the insurance of the desperately poor for small amounts—\$100 to \$300. According to charity workers, this class of people rarely have enough money to buy sufficient food, and are periodically in actual distress. Regular payments are wholly impossible, and 70% of the policies lapse after a payment or two. The insured, who are generally people of limited intelligence, are duped by the idea of receiving something for nothing, and the profits to the companies are said to be quite large. The income merely increases the dividends of the well-to-do policy holders in the mutual companies. Money is thus taken from the poor and given to the rich. It is hoped that the evil is not so great as rumored, but even if it is a small scandal, it is really too bad that agents should continue to solicit new business of this sort. The growing popular demand to limit all new business of every company is, perhaps, necessary if the evil continues. The interesting yet discouraging part of the matter is the fact that physicians are making the examinations for 25 or 50 cents! If most of the policies are to lapse, it is immaterial whether the insured are insurable or not, and the examination might be omitted or turned over to the office boy for the car fare and a package of cigarets. It is time for the profession to withdraw from such work, and insist upon proper payment for proper labor. Too many insurance magnates are now living in Europe on the money which might have been put to better use. The men who have made life insurance profitable and a necessity of modern life are the physicians. For a fee of \$3.00 they frequently save the policy holders a loss of many thousands. A lawyer would demand 10% and get it.

The sun cure for skin cancers has been reported in the *Clinical Weekly*, of Berlin, by Dr. Hirschberg, of Frankfort, according to our Consul-General at the latter place. It appears that Hirschberg himself had a small epithelioma on the outer surface of the ear, and prior to being operated upon made a trip to Switzerland and unconsciously exposed the ears to the sun's rays. He was astonished to see evidence of beginning cure, and then he carried out the treatment faithfully, with the satisfaction of a complete cure. He explained that in the mountains the actinic rays are stronger than at lower levels, but that the tanning which invariably results in the normal skin to protect the tissues from harm does not occur in the cancer area, whose cells have no power to form pigment. Hence the cancer cells are killed by the use of concentrated sun's rays at lower levels or by röntgen rays. There is, of course, no desire to use this method in other cases, for the results might not be so happy, and the usual methods are quicker and safer. The case is apparently reported to show that the usual therapeutic measures we apply deliberately are occasionally effective, even when inadvertently used. The press dispatches apparently took it for granted that a new cure had been found for all cancer cases—by simply

living in the mountains and exposing the diseased part to the sun's rays.

The medical importance of anthropology is just beginning to be appreciated, not only from the theoretical side, but also practically in treatment. It is less than a generation ago that textbooks implied or even taught that the differences between the various races of men were meaningless freaks of nature. The great awakening of biology—of itself a recent affair—has done much to popularize the law that every character has an offensive or defensive use for which it was developed and is rarely useless and still less rarely harmful. It is therefore in order to apply the law to man and find out why racial differences have developed; why some are tall, others short; some stocky, others frail; some black, others blond; some with kinky hair, others with straight. The solution of these problems cannot be expected in the near future, but enough has been done to warrant the assertion that some knowledge of physical anthropology is an important part of a physician's education, for it is at least of practical importance. To the physiologist it is essential, for it throws a flood of light upon the uses of tissues and organs which vary so greatly from race to race. It is no longer an academic study left to some old men who have nothing better to do. If it is learned why a certain character has developed in a certain environment, it is known that new immigrants not possessed of that means of defense must adopt a substitute or suffer in health. In recommending changes of climate it might be possible to select that one which is appropriate for that patient. The hygienic results would also be of vital importance. In every sense, the new study is so important that the time is not so distant when it will be not only a part of a liberal education but an essential preliminary for the study of medicine. The study of man has too long been neglected by the students of men.

The effects of the different American climate upon European settlers is a vast unexplored field, which upon investigation may yield knowledge of great importance. Only here and there and at infrequent intervals have there been any attempts to explain the disappearance of certain American families. Occasionally there is a study of a small group of immigrants and their children, but comparatively little is known of the ultimate result of residence in this continent. It must be remembered that over 50%, and perhaps 60%, of Americans have lived here only two generations, and that there is scarcely time to tell what is happening to them. In similar migrations to climates like those in the United States it is known that certain types always disappeared. There is good evidence that identical phenomena are taking place here, though so slowly that they have been unnoticed. If it is true it should be investigated and a careful record made of the types of families which fade out and the diseases or conditions which were the ultimate causes of their disappearance. The subject is one which deserves far more attention than has been given to it. Like the study of anthropology, so long neglected, it might reveal facts of practical importance to hygiene

and therapeutics. The personal reminiscences of family physicians have thus a practical value, and such academic investigations may mean the preservation of families otherwise doomed to extinction. We rarely or never realize that we are far south of the latitude in which our ancestors lived, and by wellknown natural laws we are being injured in some way.

The gullibility of rich men has been so frequently noted that there is a widespread popular impression that they are "easy marks" for exceptional swindles. This impression is false, of course, because the man of property is generally possessed of exceptional intelligence, excepting the feeble-minded who have inherited riches. Nevertheless, there are so many published instances that we are justified in suspecting that a keen money-making ability may be a special mental power which can exist in a brain otherwise very defective—financial Blind Toms who have as little discretion and morality as that poor fool. Such men may have diminutive brains, unable to think of anything except buying and selling, and instead of being instances of intelligence without brains, they illustrate the rule of all nature. The matter has a professional aspect, for it is found that the new rich are so frequently the victims of quacks. It does not make any difference how grotesque the absurdity, there are plenty of men ready to give up money for it—and rich men, too. Recent revelations in New York City, in the *Force of Life* Company, in blackmailing schemes and in cures by radium, show that the harvest is reaped among the stupid rich as well as the poor. Quackery even invaded the White House many years ago. So it is evident that exceptional ability in one line may be accompanied by lack of intelligence and result from a small brain or big brain or any size brain, but it does not disprove the fact that the more thinking materials there are, the more thoughts there will be. Brains—material brains—manage the world now as ever.

Intelligence and the brain weight have a certain definite relation to each other in spite of more or less frequent denials of the fact by men who should know better. It is true that the larger the body, the more numerous must be the nerve cells and axis cylinders to move the muscles and give nerve supply to the larger organs, so that the brain of an elephant is larger than that of a mouse; but making due allowance for all that, it is also true that in every species of animal the larger the brain, the greater is the intelligence of that species. Man's intellectual supremacy is due to the fact that in proportion to his body his brain is larger than that of any other animal. Nevertheless there are a few writers who persistently assert that his intelligence is not due to his brain and that little brains are as good as big ones, a curious delusion which if properly followed up would make a horse as sensible as a man. One writer has recently stated "that brain weight has little influence on mental capacity, however, has been proved times without number." (Editorial, J.A.M.A., Jan. 27, 1906.) The statement can be flatly contradicted. Without exception the lower races are found to have smaller average brains than the higher races, there being exceptionally

large and small ones in every race, of course, by the ordinary laws of variation. The failure to raise the lower races by education is due to this one fact, and if it were possible to so educate them that they could be the intellectual equals of the higher, then horses could be sent to school and become savants.

Other factors beside weight are known to influence intelligence. It has long been known that the distinguishing character of the human brain is the large number of connecting fibers, by which its cells are coordinated. In no other species are they so numerous or complicated. The cells constitute but a very small part of the weight. There is now considerable evidence that the same rule applies among individual men, and that those of great intelligence have more connections, so that their cells can do more and better "team-work." Some investigations have shown the corpus callosum to have a large cross section in men who had shown great ability. It is also known that the brains of able men are likely to present more convolutions and deeper ones than the average, as though there were more brain cells as well as more connections. A few observations in the lower races point to the fact that their brains are essentially different in microscopic organization, partly accounting for less intelligence. All these facts will fully explain why men of intelligence in the higher races may have brains not notably heavy, but they do not disprove the general statement that as a class such men do possess brains heavier than the average. The mistake arises from the failure to recognize that noted men who have shown intellectual power not infrequently were sharply limited to one or two directions, being very defective in other directions. Blind Tom was an idiot, in fact—an extreme case of what is quite common. At the other extreme was Gambetta, who was not much more than an orator, whose cerebral speech centers were found to be highly developed. The rest of his brain was small and his general intellectual power and judgments were decidedly defective. Ability in one or two lines may make a man famous, while he is really very defective and his brain prove to be small.

Heavy brains are not necessarily intellectual ones, or elephants would be in the class of geniuses. The material might also be pathologic and the possessor an imbecile. It often happens that men of big brain and great ability suffer from early neglect and are found in lowly employments or may remain ignorant through life. These few facts do not prove that large brains are worthless and not indicative of mental power as a rule. We cannot get away from the fact that man as an animal is supreme because of his large brain, that among races the brainiest are the highest, and that in any one race the most intelligent, as a rule, are those who have the most brains. Men of small brains are not the leaders, and no statistics of the brain weights of a few exceptional men, noted for limited abilities, can reverse the rule. It is time to stop the nonsense published to the effect that great thinking can be done without the tools. Universities do not create brains, but merely train what exists so that the owners are better fitted for the battle of life.

Many a man is sent to college who should be handling a pick and shovel and he never amounts to much even though he subsequently makes his living at some very limited specialty.

The origin of sex is a source of perennial delight to the biological world. According to Prof. Morgan,¹ of Columbia University, there were said to be 262 groundless theories recorded 250 years ago; how many have been added since, no mortal knows. He describes a new one launched by Prof. H. E. Ziegler, in which it is assumed that the chromosomes derived from the female nucleus tend to produce females, and vice versa. At the reduction division it may happen that more of one sex may go to the makeup of the new nucleus, and the majority rules as in all good democracies. Unfortunately, by the laws of chance there will often be an equal number of each side, and the new organism will then be sexless, so another discarded hypothesis must be added to the other hundreds. And now comes Prof. E. B. Wilson with still another. At the November meeting of the Natural Academy of Sciences, in New Haven, he described certain differences in the spermatozoa of insects, whereby they could sometimes be distinguished as male-producing or female-producing, according to the differences in the number of chromosomes in their early formation. In some species it is also thought that the female cell, or ovule, before fertilization, shows differences, such as size, according as it is to become a male or female organism. Sex, then, may be predetermined at the earliest moment, or even before conjugation. It is a character of the germ cells themselves, but how they are to compromise their differences, if there be a conflict of equal tendencies, is not quite evident. Something else casts the deciding vote.

The last theory of sex production is that of Professor Richard Hertwig described by Professor E. B. Wilson² who quite naturally has very little praise for it, as it is the opposite of his own, which is more in accordance with the general view of the matter. From experiments of Hertwig and his pupils it was found that in certain species—whose long names do not concern us here—one temperature produces nearly all females, but a lower temperature makes males. Overripeness or underripeness, that is, delay or hastening of fertilization, produces an excess of males. As interference with nutrition may also cause males to develop, perhaps both the above results may thus be explained, though Wilson has other explanations. Since many other conditions are known to affect the sex now and then, it is quite evident that we are no nearer the solution of the matter than ever. Still, some one, by a lucky find of a missing link, may be able to harmonize all the present discrepancies and solve this problem. For the present the practising physician can assure the expectant father with due solemnity that if it is not to be a girl in all probability it will be a boy, and that it is of no practical importance which is to make its debut. One will give him happy trouble and the other troubled happiness.

¹ Science, December 22, 1905.

² Science, February 2, 1906.

Should Physicians Charge Each Other for Medical Services?—From Hippocrates down, the answer of medical men has been a consistent and indignant No! but over in New York it seems, at least at times, "we have changed all of that." The estate of a prominent homeopathic physician was sued by a regular practitioner for his bill of \$460, and physicians testified that they habitually charged each other for visits. There has been a great deal of talk in recent years about the desire of certain professional men to rid themselves of the "old antiquated code" of ethics. One of the rules of this "antiquated and foolish" writing was that members of the Guild should be treated gratis. The psychology of the affair is pretty evident, and from the logical and inevitable second step of the *descensus Averni* toward universal commercialization and quackery there should be no shrinking. Use medical science as a tool for Success, and make the most of it you can! Be cunning and astute in your auction, but sell soul and science to the highest bidder; lay stress on "dignity" and pretend to vast knowledge and therapeutic ability; make Medicine a game and "play the game"! We should advise practitioners who hold their profession in honor, especially those of the country, to learn who believe in such doctrines, and then not to refer cases in consultation to such modern "progressives." For a physician who charges a physician for medical services when he should not do so, will charge patients when he should not do so and more than he should charge them, and in the long run it will be found that his "medical services" are of no worth.

Exophthalmia and Adenoids.—According to many authorities, a bilateral exophthalmia, even when a goiter and tachycardia are absent, is sufficient to authorize one to make a diagnosis of Basedow's disease. Such an importance attached to exophthalmia may be the means of causing very serious errors in diagnosis. Bilateral exophthalmia may in some cases have quite different explanation, and Holz¹ has reported two cases where an exophthalmia was in intimate relationship with postnasal adenoids, the removal of which resulted in a recovery from the exophthalmos. The patients were children of 7, the exophthalmia was bilateral and very pronounced, while von Graef's sign was present, likewise Stelwag's sign. The absence of any thyroid enlargement or cardiac symptoms raised a doubt as to the existence of Basedow's disease. Adenoids were found, and were removed. In the first case the exophthalmia disappeared 10 days after the growths on the nasopharynx. The patient was seen two years later, having reached the age of 9; the adenoids had returned, and the bilateral exophthalmia had also reappeared. The same treatment, followed by the same successful result, was resorted to; the exophthalmia disappearing shortly after the removal of the adenoids. In the second case the exophthalmia disappeared a fortnight after the operation. This evident relationship of cause and effect between adenoids and exophthalmia presents a certain practical interest. One should not be in haste to conclude that a patient is suffering with a precocious form

of Basedow's disease from the simple fact that the coexistence of adenoids and exophthalmia is not infrequent, because Arslan has related 10 cases of Basedow's disease and where adenoids were present, and in five of them the removal of these growths cured the exophthalmia. Holz has also related another case of interest, namely, the coexistence of adenoids and chorea; the patient was a child of 7, who presented a slight chorea, which was completely cured after the adenoids had been removed. Other authorities, such as Trautmann and Francis, have already advised removal of the tonsils in the treatment of certain cases of epilepsy, and it would seem that their results have not been devoid of success. It is probable that the relationship existing between chorea, exophthalmia, and adenoids is the same as that uniting epilepsy to enlarged tonsils, which simply represents phenomena of a reflex nature. What is important to conclude is the conduct to follow in everyday practice. Generally speaking, adenoids should be removed when an exophthalmia is present, the operative treatment presenting no danger whatsoever if carried out with prudence. It perhaps offers the unfortunate fact that it only cures temporarily, and not infrequently the patient will have a return of his postnasal growth. This recurrence, however, is not constant, and when it does occur it is frequently tardy. It is better to count on the positive results, even when the possibility of a recurrence is taken into consideration, rather than to delay operation. The patients, with their obstructed and diseased nasopharynx, have little chance of recovery from medical treatment, and even what very slight amelioration may be obtained by this means, the length of time required is most discouraging to the patient.

Nursing and Eddyism.—In view of the recent barbarous treatment of a child by a trained nurse of "mental science" affiliations, it is startling news that some 20 graduate nurses in this city are in training as Christian science healers. There would be nothing alarming about this if one could be sure that such a person would faithfully perform the duties of her present position until she had definitely gone over to the mystics. But the shocking case to which we have alluded shows how completely this sort of fanaticism may blur all sense of common honesty and fidelity. The nurse in question was, we believe, like all of her profession, under a solemn oath to obey faithfully the directions of an attending physician. Instead, in obedience to some grotesque "higher law," she deceived the physician and the family of her patient and exposed a child to imminent risk of death. In most cases the various forms of "mental healing" may pass for rather harmless delusions. But in a trained nurse it is an evident disqualification, and if the sect is indeed making headway among nurses, physicians must adopt the unusual procedure of asking the religious belief of their assistants. One must hope that the lamentable perversion of good nursing ethics will remain highly exceptional.—[*New York Evening Post.*]

Say Injuries Caused Tuberculosis.—In the suit of William Trainer, of Philadelphia, against the Southwestern Street Railway Company for damages for personal injuries received in a collision, the novel point was raised that the injuries had brought on tuberculosis. The attorneys, however, agreed to settle the case, and the unique contention was not passed on by the jury.

¹ Berliner klinische Wochenschrift, 1905, No. 4.

BOOK REVIEWS

Pharmacology and Therapeutics.—By REYNOLD WEBB WILCOX, M.A., M.D., LL.D., Professor of Medicine at the New York Post-Graduate Medical School Sixth edition. Philadelphia: P. Blakiston's Son & Co., 1905.

This is a companion book to "Materia Medica and Pharmacy," reviewed a short time ago. This is intended for medical students, while the other was more for students of pharmacy. Its therapeutic recommendations are exceedingly practical and in some cases original, while its discussions of pharmacologic actions are concise, clear, and dependable.

Materia Medica, Pharmacy, and Therapeutics.—Revised in accordance with new U. S. Pharmacopoeia. By SAMUEL O. L. POTTER, M.A., M.D., M.R.C.P., London. Tenth edition. P. Blakiston's Son & Co., Philadelphia.

Of all handy works on its subjects, Potter's is the best. Since its first appearance it has had many imitators, but none of them equal it in clearness, conciseness, or fullness. It is not an original work, like Wood's great book or Cushny's manual, but it is an intelligent compendium of the results of all important researches on its subjects. Its therapeutic recommendations are full and, on the whole, trustworthy. The latest edition has been made to conform to the new United States Pharmacopoeia.

State Laws Governing Medical Practice.—By ARTHUR J. CRAMP, Milwaukee, Wisconsin. Revised to November, 1905.

This is a pamphlet of 16 pages giving in condensed form the principal facts regarding the requirements of the various State medical boards of the United States. The address of the secretary, whether the board reciprocates, and the fee for examination are stated. Also the number of physicians to each 10,000 population. Two maps are included. The pamphlet supplies a great deal of valuable information for the nominal sum of 25 cents.

Massage and the Swedish Movements.—By KURRE W. OSTROM. Sixth edition. Philadelphia: P. Blakiston's Son & Co., 1905.

The latest edition of this instructive work furnishes the most recent methods and contains 115 illustrations. Six new subjects are considered: The Prostate Gland, Headache, Colds, Affections of the Bladder, Varicose Veins, and Hernia. It is one of the most practical of the books devoted to this subject.

Addresses and Other Papers.—By WILLIAM WILLIAMS KEEN. Illustrated. Philadelphia and London: W. B. Saunders & Co., 1905.

In this book of 441 pages are collected 25 addresses delivered by Dr. Keen before medical societies or bodies of students. The range of topics is a wide one, from the early history of practical anatomy to surgical reminiscences of the Civil war. The keynote of the larger number is the education and responsibilities of the physician to his patients, his profession, to himself. Particularly is there much wholesome advice to the student and the young practitioner, advice in beginning the practice of medicine and in adopting expedients which will be of service during his whole career. No better book could be put in the hands of a student. Dr. Keen and his publishers deserve the thanks of the profession for presenting these papers in easily accessible form.

Atonia Gastrica.—By ACHILLES ROSE and ROBERT COLEMAN KEMP. New York and London: Funk & Wagnalls Company, 1905.

This little book of 203 pages is made up of five chapters. Chapter I is on the significance of splashing sounds of the stomach, which are said always to mean relaxation or atony of that organ. Chapter II discusses methods of locating the position of the stomach and is one of the features of the book. Chapter III is devoted to atonia gastrica or gastroptosis, and a new method of treatment, namely, strapping the abdomen with rubber plaster. Directions are fully given and cases are cited to show results. The best type of plaster is discussed in Chapter V. Chapter IV is devoted to floating kidney and Chapter VI to history and literature. The book is a very valuable addition to the subject in question.

A Treatise on Diseases of the Skin, for the Use of Advanced Students and Practitioners.—By HENRY W. STELWAGON, M.D., PH.D. Fourth edition, thoroughly revised. Philadelphia, New York, and London: W. B. Saunders & Co., 1905.

But little more than three years have passed since the first appearance of Stelwagon's treatise on diseases of the skin; and already the fourth edition is before us for review. While there are numerous changes and additions throughout the text, these are, for the most part, of a minor character, the principal additions being found in those sections which treat of the therapeutic uses of the röntgen ray, high-frequency currents, and the Finsen light, agents which, especially the first two, are finding more and more use in a constantly increasing number of cutaneous affections. Attention is called to the unexpected and, in some cases, serious alterations in the nutrition of the skin, which may appear a considerable time after exposure to the röntgen ray has ceased, a matter about which a word of warning is quite in place at this time. A considerable number of new half-tone plates have been added to the already unusually large number which embellish the book, and the colored plates borrowed from Mracek's atlas have been replaced by lithographs of some of the author's own cases.

Abdominal Operations.—By B. G. A. MOYNIHAN M.S. (London), F.R.C.S. (Leeds). W. B. Saunders & Co., Philadelphia, New York, and London. 1905.

This, the latest addition to "Regional Operative Surgery," is one of the highest value. In the first section the bacteriology of the stomach and intestines is considered. The topic, which is somewhat unique for a textbook, is nevertheless very interesting. The preliminary technic of abdominal operations with postoperative treatment is next considered and then Dr. Moynihan takes up the more technical portion, beginning with the various abdominal incisions. The rest of Section I is devoted to the surgical treatment of the various forms of peritonitis, penetrating wounds of the abdomen, subphrenic abscess, and surgery of visceral prolapse. The surgical procedures on the stomach, intestines, liver and bile passages, diseases of the pancreas and spleen, each have an entire section devoted to them. The various forms of procedure are fully given and their comparative values commented upon. Dr. Moynihan has made free use of statistics, and cases from his own practice are used for purposes of emphasis. Throughout, the work is stamped by the author's high ability.

Therapeutics: Its Principles and Practice.—By HORATIO C. WOOD, M.D., LL.D. J. B. Lippincott Company, Philadelphia, 1905.

Wood's Therapeutics still holds its primacy. In reviewing the previous edition we called attention to the changes in plan that had been made from the earlier

issues of the book. Concerning the present edition, it is only necessary to say that it has been adapted to the new United States Pharmacopeia and includes such of the newer synthetics as are worthy of professional attention. Not the least among its merits is its literary style. For clarity of phrase, vividness of description, soundness of judgment, comprehensiveness of knowledge, accuracy of statement, and thoroughness of information, Wood's book is still without a rival. Its therapeutic recommendations are always to be depended upon. Although some of us might question here and others wish to add there, this is only a natural outcome of differences in personal experience. For example, Dr. Wood does not value organotherapy at its full worth. This, however, at the most, is but a minor blemish. The work is, we repeat, the best textbook, the best book of reference in the English language on the great subject of which it treats.

A Manual of Materia Medica and Pharmacology.

—By DAVID M. R. CULBRETH, Ph.G., M.D.
Fourth edition, enlarged and revised. Lea Brothers & Co., Philadelphia and New York, 1906.

We have so recently reviewed this work that all that is necessary now to say is that it has been revised and brought up to date and made to conform to the new United States Pharmacopeia. We see no reason to withdraw our former high opinion.

Diseases of the Liver, Gallbladder, and Bile Ducts.

—By H. D. ROLLESTON, A.M., M.D. (Cantab.),
F.R.C.P. Philadelphia, New York, and London:
W. B. Saunders & Co., 1904.

Dr. Rolleston has for a number of years paid special attention to the diseases of the liver, both from the clinical and pathologic points of view. His experience and unusual facilities for studying cases of this kind peculiarly qualify him for writing such a book, and his reputation in the treatment of hepatic diseases is sufficient assurance of the practical usefulness of this new work. All the affections of the liver are completely and clearly discussed, special attention being given to pathology and treatment. The book also contains articles on Diseases of the Gallbladder and Bile Ducts, which are equally as trustworthy as the section on the Liver. Dr. Rolleston quotes a large number of clinical cases which we believe will be of great value to the practitioner. The illustrations are excellent and include several colored plates. The work reflects an unusual degree of experience in a difficult but highly important branch of medical study, and will undoubtedly prove of service to both physicians and surgeons.

Progressive Medicine.—Edited by HOBART AMORY HARE and H. R. M. LANDIS. Vol. VII, No. 4, December 1, 1905. Lea Brothers & Co., Philadelphia and New York.

The contents of the last number of Vol. VII are: Diseases of the Digestive Tract and Allied Organs, the Liver, Pancreas, and Peritoneum, by J. Dutton Steele; Genitourinary Diseases, by William T. Belfield; Diseases of the Kidneys, by John Rose Bradford; Anesthetics, Fractures, Dislocations, Amputations, Surgery of the Extremities, and Orthopedics, by Joseph C. Bloodgood; and Practical Therapeutic Referendum, by H. R. M. Landis. This number, as the others of the year, contains the gist of the literature on these subjects presented by men capable of choosing the very best for their readers. It completes a most successful year for this sterling publication. The part of Bloodgood's article dealing with tumors of the extremities is fully illustrated, 5 colored plates being included. Landis, in his valuable therapeutic review, calls attention to several facts which emphasize the need of caution in the use of adrenalin.

AMERICAN NEWS AND NOTES

GENERAL.

More Yellow Fever in Panama.—Another case of yellow fever having developed at Bocas del Toro, H. D. Reed, executive secretary in the Department of Government and Sanitation on the Canal Zone, will confer with Foreign Secretary Guardia regarding the most efficient means of exterminating the fever there.

Replacing the Ration.—The commissary general and the Surgeon-General of the army have developed a plan of replacing the ration issued to enlisted men in hospitals and the nurse corps on duty in hospitals with a commutation. The change is regarded by Secretary Taft as in the public interest and is strongly urged by the department. The change will require special provision of law, which it is hoped to have incorporated in the army bill.

Personal.—Dr. Paul G. Woolley, director of the serum laboratory of the Bureau of Science in the Philippines, has accepted, under the Government of Siam, the directorship of the pathological laboratory, which it is proposed to start as soon as Dr. Woolley can reach Bangkok.—Dr. W. W. Keen's private hospital in Philadelphia will be closed June 1. The patients convalescing will be transferred to Jefferson Hospital, where elaborate rooms are being fitted up for Dr. Keen's use.—It is understood that the will of Dr. William T. Bacon, who died at Hartford, Conn., last week, contains several large public bequests. It is said that his entire estate is given for life to Mrs. Bacon, but that at her death the Hartford Medical Society will receive an endowment of \$100,000, and Yale University will get a part of the residuum of the estate, which is understood to be worth nearly \$300,000.

EASTERN STATES.

A Tuberculosis Hospital for Fall River.—Mayor Coughlin of Fall River, Mass., has sent a recommendation to the board of aldermen asking for an appropriation of \$5,000 for erecting a lean-to shack for tuberculous patients in connection with the city hospital. At present 12 persons suffering from tuberculosis are cared for temporarily in a shed adjacent to the main building.

NEW YORK AND VICINITY.

Warning to Hospitals.—A bill has been introduced into the New York Assembly which provides that any hospital official who shall transfer a patient to another institution while such patient is ill, shall be fined \$5,000 on conviction or suffer imprisonment for five years.

Patent Medicine Bill Amended.—Senator Stevens, of New York Assembly, has obtained the amendment of his bill relative to the labeling of patent medicines, making it more stringent and giving Boards of Health in cities of the first class, power to make regulations for the enforcement of the law.

New York's Annual Deathrate 18.31.—Deaths in New York City during 1905, according to health department records, numbered 73,714, giving a deathrate of 18.31 per 1,000, made up by boroughs as follows: Manhattan, 18.74; the Bronx, 20.25; Brooklyn, 17.57; Queens, 16.03; Richmond, 19.04. These figures are based on an estimated population of 4,024,780. As there were 103,881 births during 1905, the net gain over deaths, from this source, was 30,167. There were 42,675 marriages reported last year. Almost exactly one-third of all the deaths were of children under five years of age, 24,539; between 35 and 40 was the next highest period, with a record of 4,355 deaths. Tuberculosis of the lungs caused the most deaths, 8,535. There were also 1,123 deaths from other forms of tuberculosis. Bright's disease was second, with 5,944 deaths. Meningitis caused 2,584 deaths, smallpox only 9. There were 4,476 so-called vio-

lent deaths, the total including 660 cases of suicide and many of accident, as well as murder cases. During the year the large total of 20,831 cases of tuberculosis were reported—almost one-third of all the cases of contagious diseases.

More Medical Dens Barred.—Orders have been issued by Postmaster-General Cortelyou instructing postmasters at New York and Brooklyn to refuse to admit to the mails the advertisements of 52 illegal "medical offices" located in those cities, and also to refuse to deliver mail matter received addressed to the fictitious and assumed names under which parties conducting these concerns hide their identity. The number of deaths that have been caused in these offices can never be known. The volume of business done by these concerns was large. It was said that as high as 20 criminal operations a day were performed in some of these offices and that the income sometimes ranged as high as \$2,000 a week.

Measles and Diphtheria in New York.—Health Commissioner Darlington has appealed to the people, asking that every precaution be taken to prevent the spread of measles and diphtheria, since both diseases have been increasing rapidly in all sections of the city. In January and February there were 616 more cases and 77 more deaths from diphtheria than during the same period of last year. The record of March, 1904, when 7,000 cases were reported, will be broken unless the epidemic is curbed. In February, 6,310 cases of measles were reported, and during the first week in March 1,899 more. The report of the health department, covering a period of 13 weeks, shows that Ellis Island is one of the most fertile spots for the breeding of disease in the city.

PHILADELPHIA, PENNSYLVANIA, ETC.

Ambulance for Hospital.—Mrs. Robert H. Foerderer has given an order for a fine ambulance which she will give to the Frankford (Phila.) Hospital. The hospital has been in need of a new ambulance, as the institution was forced a number of times to use ordinary wagons to move the sick.

Cost of Philadelphia's Insane.—The city commissioners have received bills for maintaining the city's insane, numbering 1,834. The cost to the city for the quarter ending February 28 is \$31,286.50. The city has 1,437 patients at Norristown, 390 at Wernersville, 5 at Danville, and 2 at Harrisburg.

Health Officers Stir Chinatown.—Chief Abbott, of the Philadelphia Bureau of Health, is determined to make conditions in Chinatown sanitary, even if strenuous measures have to be resorted to. The Chinamen have been slow in carrying out the rules of the bureau, and a weekly inspection of the Chinese quarters will be made.

Can Kill Diseased Horses.—The Attorney-General of Pennsylvania has furnished State Veterinarian Pearson with a written opinion to the effect that the State Live Stock Sanitary Board has the authority to condemn and order the destruction of a horse afflicted with glanders, the owner of which refuses to enter into any agreement as to the value of the animal or to designate an appraiser to represent him.

Tenement House Inspection in Philadelphia.—Chief Abbott, of the Health Bureau, after a recent inspection of the tenement houses in Chinatown, said that the conditions in that locality should not exist in any civilized community. In many of the rooms there were no windows, "and the apartments were entirely devoid of a means of ventilation. There were sleeping rooms which contained as many as three beds."

Fumigation Closes School.—The James Lynd School, which has an enrolment of 1,000 children, was closed last week for fumigation because of a case of diphtheria among the pupils. Since the beginning of this

year 48 schools have been closed for one or more days for fumigation deemed necessary because of cases of infectious diseases among the pupils or their families, entailing an average loss of one day's instruction to about 25,000 children.

New Seashore Hospital.—A committee of the Board of Governors of the Atlantic City Hospital announces that a handsome hospital building, to cost \$100,000, will be erected as speedily as possible after the close of the coming summer season. Subscriptions of \$50,000 are already in hand. It is expected to complete the total fund during the present week and to proceed at once to adopt plans for the proposed building.

Suits to Remedy Eyesight Defects.—After having been forced to exclude from the Philadelphia schools a great many children on account of defects of eyesight, which the parents refused to remedy, the Committee on Elementary Schools, with the Compulsory Education Department, decided to bring suit against parents persisting in their refusal. The city solicitor urged the committee to institute a test case.

SOUTHERN STATES.

University of Virginia.—The institution has recently received \$60,000 for the completion of the University hospital, a chain of five buildings. Of this sum, \$50,000 was given by Charles Steele, of the firm of J. Pierpont Morgan & Co., and the balance by Miss Helen M. Gould, to provide a ward for colored patients.

WESTERN STATES.

Fund for Serum Research.—Dr. Benjamin Taylor Terry, of Columbia University, New York, has offered Indiana University an endowment for pathologic research, the field to be limited to the general subject of serum pathology and the endowment to take the form of a research fellowship in the department of pathology. The income of the fellowship will be \$750 per year. The offer is made under the condition that Indiana University provide a private room and adequate library and laboratory facilities for such work.

May Exclude Tuberculous Pupils.—Attorney-General Mullan, of Iowa, has held that the rule passed last November by the State Board of Health that all persons affected with tuberculosis shall be excluded from Iowa schools and colleges is legal and enforceable. The order goes into effect at once. Local physicians believe this is a long step toward the suppression of disease. They are much disappointed that the Legislature refused to pass the bill establishing a State sanatorium for tuberculous patients. The State Board of Health has been working for this for some time.

Fighting Impure Foods in the Middle West.—Arkansas' experience with adulterated foods is very much in line with that of other States, being, if anything, a little more discouraging. The State's Experiment Station collected in the open market 354 samples of canned vegetables, fruits, catsups, dairy products, jams and jellies, baking powders, vinegar, soda water, syrups, etc., all of which were examined analytically. A tabulation of the results show that 47%, or nearly one-half of all the samples examined, were either adulterated or sophisticated. The Minnesota State Dairy and Food Commissioner, in a recent report of examinations made under the State pure food law, show that out of nearly 12,000 samples analyzed fully one-third were illegal. The annual report of the Ohio Dairy and Food Commissioner is in very much the same vein. The total number of samples examined, which included condiments, beverages, dairy products, spices, flavoring extracts, drugs, etc., amounting in the aggregate to 2,400, show fully one-third to be adulterated or sophisticated. Prosecutions were instituted on 132 adulterated articles. The State Food Commissioner of Illinois, in his last annual report, finds similar deplorable condi-

tions to exist in that State, notwithstanding the stringent pure food laws. In the total number of foods examined almost 40% were adulterated.

FOREIGN NEWS AND NOTES

GENERAL.

Examinations.—New regulations have been published for competitive examinations for admission to the Indian medical service. Candidates must be natural born subjects of His Majesty, of European or East Indian descent, between the ages of 21 and 28 at date of examination, and must possess registrable qualification to practise both medicine and surgery in Great Britain and Ireland. Examinations take place as a rule twice a year, namely, in January and July.

School "Hygiene."—The humanizing of the elementary school has in Neuchâtel reached a point which may safely be said to be in advance of anything yet attempted in any other country. A list of districts is mentioned in the Cantonal newspapers in which, in the public schools, there is included in the "curriculum" the gratuitous and compulsory administration of cod liver oil to all children for whom the school doctors prescribe it. Contrary to the usual experience of private families in such a case, the public administration of the oil in school is stated to be attended by no refractory symptoms. They are disciplinarians in Switzerland.

OBITUARIES.

R. Ogden Doremus, aged 82, March 22, at his home in New York City. He was graduated from the New York University, New York City, in 1842. He was a noted toxicologist, and the originator of the present method of conducting examinations in poisoning cases. For 60 years he was instructor in chemistry in the New York College and the College of the City of New York, and 45 years occupied the chair of chemistry in the Bellevue Hospital Medical College. He was a member of the Medico-Legal Society of New York and many other local societies.

DeSaussure Ford, aged 72, February 4, at his home in Atlanta, Ga. He was graduated from the Medical College of Georgia in 1856. He was president of the Georgia State Medical Association, chief surgeon of the Georgia Railroad and division surgeon of the Southern Railway. He was the inventor of the tar solution, which has done much to prevent suppuration in wounds. He served in the Confederate Army during the Civil war.

George S. Woodman, aged 82, March 22, at the home of his daughter in Cambridge, Mass. He was graduated from Harvard Medical School in 1849. During the Civil War he acted as examining surgeon for the United States Government in Brooklyn, N. Y. He was a member of the Massachusetts Medical Society; of the Homeopathic Medical Society, and of the Alpha Delta Phi fraternity.

Arthur H. Davis, aged 63, March 23, at the German Hospital, Philadelphia. He was graduated from the University of Pennsylvania in 1866. He was a veteran of the Civil war, having enlisted in the One Hundred and Ninety-second Regiment.

Jessie M. McGregor, March 22, from cerebrospinal meningitis, at her home in Denver, Colo. Dr. McGregor ranked among the best of women physicians and won distinction at Edinburgh, Leipzig, and Paris.

E. M. Southwick, aged 39, resident physician at the Presbyterian Home, March 25, at his home in Philadelphia. He was graduated from the Maryland General Hospital in 1898.

Robert E. Bromwell, aged 79, March 23, at his home in Port Deposit, Md. He was graduated from the University of Maryland School of Medicine in 1850.

Francis J. Wennerberg, aged 37, March 24, from pneumonia, at his home in Boston, Mass. He was graduated from Harvard Medical School in 1893.

Henry Fisher Camblos, aged 48, March 26, at his home in Philadelphia. He was graduated from Jefferson Medical College in 1881.

Reuben V. Spackman, March 20, at his home in Dubois, Pa. He was graduated from Jefferson Medical College in 1870.

Benjamin W. Carpenter, aged 69, March 20, at his home in Burlington, Vt. He was a veteran of the Civil war.

THE PUBLIC SERVICE

Changes in the Medical Corps of the U. S. Army for the week ended March 24, 1906:

Major FRANK R. KEEFER, surgeon, will report to the commanding officer, Second Squadron, Second Cavalry, in camp, Presidio of San Francisco, Cal., for duty with that command en route to station at Fort Riley. Upon completion of this duty, Major Keefer will return to his proper station, Presidio of Monterey.—Major FRANK R. KEEFER, surgeon, is granted leave for one month, to take effect upon completion of duty assigned him with the Second Squadron, Second Cavalry, with permission to apply for an extension of one month.—Major HARRY M. HALLOCK, surgeon, is granted leave for one month on surgeon's certificate.—FRANK SUGGS, contract surgeon, is granted leave for two months, to take effect upon the arrival of a medical officer at Fort Mansfield.—Colonel JOHN D. HALL, assistant surgeon-general, is retired from active service on March 17, 1906, under the provisions of the act of Congress approved June 30, 1882. Colonel Hall will proceed to his home.—The following changes in the stations and duties of officers are ordered: Captain WESTON P. CHAMBERLAIN, assistant surgeon, having reported his arrival at San Francisco, will proceed to Jackson Barracks for duty, relieving First Lieutenant William L. Little. Lieutenant Little will proceed to Fort Sam Houston for duty.—First Lieutenant ROBERT L. CARSWELL, assistant surgeon, having reported his arrival at San Francisco, Cal., will proceed to Fort McDowell for duty at the depot of recruits and casualties and by letter to the commanding general, Department of California, relieving First Lieutenant Nelson Gapen, assistant surgeon. Lieutenant Gapen will proceed to Columbus Barracks for duty.—Major CHARLES M. GANDY, surgeon, is relieved from his present duties, to take effect at such time as will enable him to comply with this order, and will proceed to West Point, N. Y., and report at the close of the present session at the United States Military Academy to the superintendent of the academy for duty, to relieve Lieutenant-Colonel Harry O. Perley, deputy surgeon-general.—First Lieutenant ROBERT L. CARSWELL, assistant surgeon, is granted leave for one month.—First Lieutenant JAMES CARROLL, assistant surgeon, is detailed to represent the medical department of the army at the annual meeting of the Louisiana State Medical Society to be held at New Orleans, La., May 8, 9, and 10.—Lieutenant-Colonel HARRY O. PERLEY, deputy surgeon-general, upon his relief from duty at the United States Military Academy, will proceed to San Francisco, Cal., and take the first available transport sailing from that place for the Philippine Islands, where he will report to the commanding general, Philippines Division, for assignment to duty.—HENRY M. HALL, contract surgeon, leave granted January 17 is extended one month.—First Lieutenant LOUIS C. DUNCAN, assistant surgeon, is granted leave for one month, with permission to visit China and Japan, effective about March 15.—First Lieutenant WALTER C. CHIDESTER, assistant surgeon, is relieved from further duty in the department of Min-

danao, and will report to the commanding general, department of Luzon, for assignment to duty.—The following changes in stations and duties of officers are made: Major RUDOLPH G. EBERT, surgeon, will report to the commanding general, department of Luzon, for assignment to duty.—Major THOMAS U. RAYMOND, surgeon, will proceed to Zamboanga, Mindanao, reporting to the commanding general, department of Mindanao, for assignment to duty.—Captain THOMAS S. BRATTON, assistant surgeon, will report to the chief surgeon of the division for duty in his office, with station in Manila, P. I.—Major FRANCIS J. IVES, surgeon, is relieved from duty in the department of Luzon, and will proceed to Manila and assume command of the division hospital, relieving Major William D. Crosby, surgeon.—First Lieutenant JAMES D. HEYSINGER, assistant surgeon, is relieved from duty in the department of the Visayas, and will proceed to Manila, reporting to the commanding general, department of Luzon, for assignment to duty.—JOHN T. H. SLAYTER, contract surgeon, is relieved from duty in the department of Mindanao, and will proceed to Manila, reporting to the commanding general, department of Luzon, for assignment to duty.

Changes in the Medical Corps of the U. S. Navy for the week ended March 24, 1906:

W. J. ZALESKY, assistant surgeon, detached from the Yankee and ordered to the New York.—F. E. CAMPBELL, assistant surgeon, detached from the Newport and ordered home to wait orders.—E. M. BROWN, passed assistant surgeon, orders of March 5, revoked; detached from the naval medical school, Washington, D. C., and ordered home to wait orders.—C. C. GRIEVE, assistant surgeon, detached from the Frolic and ordered to the Wilmington.—J. FLINT, assistant surgeon, ordered to the Franklin.—I. F. COHN, assistant surgeon, ordered to the Naval Hospital, Norfolk, Va.

Changes in the Public Health and Marine-Hospital Service for the week ended March 21, 1906:

H. W. AUSTIN, surgeon, granted four months' leave of absence from March 26, 1906, with permission to go beyond the sea.—G. B. YOUNG, passed assistant surgeon, directed to report to Assistant Surgeon-General W. J. Pettus, chairman of board of examiners, April 2, 1906, at Washington, D. C., to determine his fitness for promotion to grade of surgeon.—H. W. WICKES, passed assistant surgeon, leave of absence granted for two days from March 16, 1906, revoked.—G. H. LAVINDER, passed assistant surgeon, relieved from duty at Stapleton, N. Y., and directed to proceed to Detroit, Mich., and assume temporary command of service during the absence of Surgeon H. W. Austin.—J. S. BOGGESS, assistant surgeon, relieved from duty at Cape Charles Quarantine Station and directed to proceed to Stapleton, N. Y., reporting to the medical officer in command for duty and assignment to quarters.—GEO. L. COLLINS, assistant surgeon, relieved from duty at Reedy Island Quarantine Station and directed to proceed to Cape Charles Quarantine Station and assume command of the service.—H. D. LONG, assistant surgeon, granted leave of absence for seven days from March 10, 1906, under Paragraph 191 of the Regulations.—HUGH DE VALIN, assistant surgeon, relieved from duty at Baltimore, Md., and directed to proceed to Reedy Island Quarantine Station, reporting to the medical officer in command for duty and assignment to quarters.—R. S. PRIMROSE, acting assistant surgeon, granted leave of absence for 30 days from March 18, 1906.—MALCOLM MCKAY, pharmacist, granted one day's leave of absence.

Board Convened.—A board of medical officers was convened to meet in Baltimore, Md., March 21, 1906, for the physical examination of an officer of the Revenue Cutter Service. Detail for the board: Surgeon L. L. Williams, chairman; Assistant Surgeon W. H. Frost, recorder.

SOCIETY REPORTS

WESTERN SURGICAL AND GYNECOLOGICAL ASSOCIATION.

Fifteenth Annual Meeting, Held in Kansas City, Mo.,
December 28 and 29, 1905.

[Specially reported for *American Medicine*.]

[Concluded from page 422.]

Drainage of the Male Pelvis.—WILLIAM JEPSON (Sioux City, Iowa) read a paper on this subject, in which he pointed out the indications for drainage of the male pelvis, and spoke of the obstacles in the way of instituting such drainage as compared with the female pelvis. He described a method of instituting drainage of the male pelvis, and reported the results he obtained in 19 cases. In all of these cases there existed a diffuse pelvic peritonitis, with accumulations of purulent fluid often elevating the distended bowel high into the abdomen, and in two cases ascending between the mesentery and descending colon and overflowing from the pelvis into the left subrenal fossa, which was also opened and drained. In all but five cases free pus existed in the space to the outer side of the ascending colon, which in each instance was drained through the ileocolic space. In one case the distended parietic bowel necessitated opening and the establishment of an artificial anus. Three of the cases thus treated had died, one after an illness of nearly five months, during which time death on three or four occasions was threatened by intestinal obstruction, while a number of abscesses followed in the abdominal wall. Death resulted from exhaustion incident to the prolonged suppuration. In the second fatal case death took place 10 days after the operation, due to toxemia.

Gastric Dyspepsias Amenable to Surgical Treatment.—WILLIAM E. GROUND (Superior, Wis.) said it was now recognized that many forms of digestive disturbance were dependent upon conditions entirely outside the stomach, and involved this organ either by direct extension of the pathological process or indirectly by nerve influence. Among these might be mentioned inflammatory or irritative conditions in the biliary apparatus, pancreas, duodenum or appendix, and adhesions of the stomach to the surrounding viscera. Within the stomach conditions remediable by surgical means were perforative and nonperforative gastric ulcer, chronic gastric ulcer, hemorrhage, pyloric obstruction, gastric dilation with stasis, hyperchlorhydria, and cancer. The question of operative interference in some of these conditions was still in dispute, but the wisdom of referring cases of perforating gastric ulcer with or without adhesions, cicatricial stenosis of the pylorus, adhesions of the stomach to any of the surrounding structures and perhaps chronic gastric ulcer to the surgeon was now pretty firmly settled. Closely associated with ulcer was the sequence of cicatrization and contraction, and when this process involved the pylorus it led to stenosis and obstruction, and later if this were prolonged, gastric dilation and atony would result. Whether the pylorus was obstructed by spasm due to the presence of the ulcer or to hyperchlorhydria, which almost always accompanied nonmalignant ulcer, or to the cicatricial contraction following the healing of an ulcer, the pylorus was rendered incapable of readily transmitting its contents, the stomach became distended, and its muscular walls weakened, leading ultimately to permanent atonia gastrica. Stomach dilation might be due to atony alone, but it was much more frequently due to mechanical obstruction at the pylorus. In this condition of gastric stasis, food might remain in the stomach a day or more, whereas, as Reigel said, it should empty itself within seven days at the most. In fairly advanced cases, when the obstruction

had given rise to a compensatory hypertrophy of the stomach, the peristaltic movements might be seen and felt through the abdominal walls, usually accompanied by pain and vomiting. Later, when the stomach began to dilate and assumed a more passive state, the patient complained of fullness and epigastric pains after meals. Fermentation took place, causing eructations and heartburn, and frequently vomiting. Vomiting was a most prominent symptom when gastrectasia and fermentation were well established. When this sequence of events was set up, there was but one remedy, and that is surgical intervention. In view of the information of the curative effects of operation, they could not be attributed alone to drainage of the stomach or to short circuiting of the food current, as was so often contended, for unless the pylorus was closed food would pass through it. The explanation the writer had arrived at was to the effect that the cutting of the circular fibers in the pyloric end of the stomach did away to a considerable extent with the muscular unrest accompanying gastric digestion, especially where ulceration was present. To the author's way of thinking, a gastroenterostomy acted much the same as cutting the fibers of the sphincter ani in anal fissure. In this latter condition the feces continued to pass over the ulcer, but the paralyzed sphincter prevented friction, and it healed readily.

Restoration of the Perineum.—HOWARD HILL (Kansas City, Mo.) said that the perineum was divided into three layers: A superficial sphincter layer; a middle ligamentous layer; and a deep layer consisting of the levator ani muscle and its fascia. An ideal operation consisted in restoring the different planes of tissue to their normal position. It mattered little which incision was used to expose the structures mentioned, but he had used a transverse incision, which consisted in raising a flap of the posterior vaginal wall and had done the operation by using three layers of sutures. The first included the levator ani and its fascia, reattaching that portion of the muscle which helped to form the perineal center in front of the rectum. Next he identified and sutured the triangular ligament and attached the sphincter ani to the perineal center. A single suture was used for the bulbocavernosus.

Conservatism in Postoperative Treatment.—S. C. BEEDE (David City, Neb.) referred to the increasing tendency among surgeons to hasten their patients out of bed and hospital after grave operations. His attention was first directed to this matter when members of the laity began to mention frequently the shortness of time patients were detained by this or that surgeon. Nurses would speak with pride of the fact that their favorite operator would send a hernia or an appendix case home in two weeks. Then another one, not to be outdone, made it 12 days instead of 14. Another, to make a better showing than his competitor, shortened the period of disability to ten days, only to be met by a more daring rival with an eight-day period for a clean abdominal section. This was not the limit of extravagance in this strife to make it appear easy to be operated, but patients after extensive abdominal work had been carried out of bed and placed in a chair on the third day and allowed to walk about the room on the fourth. It was creditable that the many weeks in bed once necessary could now be avoided by a more perfect technic, especially in the matters of more perfect control of hemorrhage, aseptic precautions, discarding irritating antiseptics, avoiding unnecessary traumatism, and care in suturing and suture tension.

Officers.—The following officers were elected for the ensuing year: President, Malcom L. Harris, of Chicago, Ill.; first vice-president, A. L. Wright, of Carroll, Iowa; second vice-president, C. Lester Hall, of Kansas City, Mo.; secretary-treasurer, Arthur T. Mann, of Minneapolis, Minn.

Salt Lake City, Utah, was selected as the place for holding the next annual meeting.

THE SOUTHERN SURGICAL AND GYNECOLOGICAL ASSOCIATION.

Eighteenth Annual Meeting, Held in Louisville, Ky.,
December 12, 13, and 14, 1905.

[Specially reported for *American Medicine*.]

[Concluded from page 421.]

Chronic Endocervicitis; a New Method of Treatment with New Instruments.—DANIEL H. CRAIG (Boston, Mass.) said that the diagnosis was made to depend upon the condition of contraction or relaxation of the internal os. If with an ordinary Simpson or Sims uterine sound distinct resistance was encountered at the internal os, in the absence of flexions, the inflammation was confined to the tissues external to the internal os. If, on the other hand, the internal os was distinguished with difficulty or not at all, because of its relaxation and wide caliber, the inflammation was above the internal os, which was thus widely dilated to favor free drainage and to guard against back pressure. Treatment by Craig's method should be strictly confined to those cases in which the internal os was distinctly contracted. The author's treatment or operation consisted in curetting the cervical canal up to but not beyond the internal os with a specially designed curet after dilation of the external os with a conical dilator also specially designed for this purpose. The operation was quickly and easily performed at the office of the gynecologist without the use of anesthesia, except occasionally a few crystals of cocaine at the external os, and without confinement to bed. The pain, when done without cocaine, was about the same as that due to the filling of teeth. Inasmuch as the most rigid asepsis was requisite to render such ambulatory treatment safe, the author did not offer this little operation for the use of those not thoroughly familiar with surgical and gynecological manipulations, but for those who were able to establish and maintain a rigid asepsis. The preparatory and after-treatment consisted of three 1 to 5,000 formalin douches daily for three days before and for ten days after the operation, with avoidance of unusual exertion and abstinence from sexual relations. The cure was prompt and complete, only a relatively very few severe cases having required more than the original curetment. Tuboovariitis or other concomitant disease, which might be aggravated or lead to a recurrence, constituted a contraindication to treatment, except as an immediate preliminary to radical operation. The treatment was not intended as a substitute for tracheloplasty, nor for uterine curetment in cases in which the disease had invaded the corporeal endometrium. The use of the author's method should not be attempted until the original paper had been read in detail.

Fracture Dislocation of Condyles of the Femur with Backward Luxation of Leg.—GEORGES S. BROWN (Birmingham, Ala.) reported a case in which he did an open operation seven months after the receipt of the injury. He resorted to subperiosteal resection of the fragments with reduction in wiring which resulted in the cure of a bad deformity, and the limb of the patient was now normal except for a half inch of shortening. The patient, aged 14, was injured in a football game at a small college, and was treated for three months for sprained knee. A skiagraph revealed fracture dislocation of condyles. He walked for four months after this with bad valgus and flexion of the leg on the thigh before submitting to an operation. The limb and knee-joint were restored to normal. There was bony union of the fragments in their dislocated position. Through a four-inch incision down the inner aspect of the femur, the lower end of which stopped short of the level of the knee-joint, the periosteum was cut through and pushed downward, the union chiseled through, the broken surfaces resected, and the leg brought forward on the thigh

without opening the joint. The fragments were wired and the internal lateral ligament closed with kangaroo tendon. The skin was closed with a subcuticular suture of silkwormgut. Owing to the first dressing being left too long, there was a superficial infection which did not interfere with the final good result.

The Technic of Appendicitis.—W. P. CARR (Washington, D. C.) said that no disease presented more varieties and more grades of severity than appendicitis. There were all shades between a mild catarrhal attack and a severe gangrenous case with diffuse peritonitis. It was apparent that no one method of operating would suit all cases. Surgeons must modify the technic to suit the case and the strength of the patient. In his first 100 cases he had 8 deaths. In his last 72 cases he had had but 2 deaths, and he believed the improvement in mortality was due to a fuller knowledge of the condition of the patients and a suitable adjustment of the technic to those conditions. For practical purposes he divided all cases of appendicitis into four classes: (1) Unruptured, uncomplicated; (2) unruptured, complicated by other serious disease, such as nephritis, tuberculosis, or myocarditis; (3) perforated or ruptured—first 36 hours; patient in good general condition; (4) perforated or ruptured—after 36 hours; complicated by diffuse peritonitis or by asthenia from long illness or by other serious disease; patient in bad general condition. Each class was discussed at considerable length. As to the incision it should always be either the gridiron or through the rectus muscle; otherwise, hernia was very liable to follow. There was but one objection to the gridiron incision, namely, it could not be greatly enlarged without cutting across the fibers of the internal oblique and transversalis muscles. This, he thought, should never be done. It was better to close the wound and open again through the rectus muscle if a very large opening became necessary. However, if this incision was well placed it might be stretched with the fingers, and a fairly large opening made through which any uncomplicated operation might be done. The stretching should never be excessive, as paralysis of the stretched muscle fibers might result and hernia follow.

Neglected Appendicitis.—CHARLES M. ROSSER (Dallas, Texas) conceded the safety of an acutely inflamed appendix while the pathology was limited to the structures of that viscus; but the serious mortality following cases not so treated justified a classification of those passing the initial stage as being neglected, whether the delay was due to indifference, ignorance, or cowardice, and whether the responsibility was upon the family, patient, or medical adviser. The safe time limit would vary with the character of the attack of inflammation, the skill of the operator, and the resistance of the individual. The author considered the question of whether to operate settled affirmatively; that when to operate was agreed to, if early; but he proposed the question of who shall operate, and what operation shall be done. While appendectomies were occasionally simple in performance, yet they were prospectively delicate, and the patient was entitled to the most skilful service available in each instance, and he thought the geographical distribution of competent surgeons was sufficiently general that there was hardly an excuse for an emergency operation by the attending physician if he were not so equipped. He advised incision in all cases at all stages except those already moribund, and in which added insult to vitality would be immediately hazardous, and a class having reached complete adhesive protection, in which a relaxed rectal orifice indicated early rupture and discharge by that route. After incision the surgeon must decide whether to remove the appendix alone, removal and drainage, or whether drainage alone should be the operation of election. But as exploration could best determine an otherwise indefinite pathologic progress the patient should be given the benefit of the doubt.

CLINICAL NOTES AND CORRESPONDENCE

(Communications are invited for this Department. The Editor is not responsible for the views advanced by any contributor.)

A CASE OF LEAD-POISONING CAUSED BY THE USE OF LEAD ACETATE IN THERAPEUTIC DOSES.

BY

WILLIAM PEPPER, M.D.,
of Philadelphia.

In the issue of *American Medicine* for October 14, 1905, appeared a short article, with the above title by Dr. Arneill, of Denver, in which he reported an interesting case of dysentery that had been treated with a prescription containing lead. It was thought that the patient had taken from 2 dr. to 2½ dr. of lead acetate in the course of five or six weeks; the prescription having been refilled a number of times unknown to the physician. The case reported was a coal miner who after he had taken the lead acetate, came again to Dr. Arneill suffering intensely with colica pictonum, which was relieved after ten days of treatment. He had a typical blue line on his gums, no red cells were found containing basic granulations, the gastric juice contained no free hydrochloric acid, was of a low total acidity and contained lactic acid, but no Oppler-Boas bacilli. Having recently seen a very similar case, I have thought it worth putting on record in connection with Dr. Arneill's report. Unfortunately the exact amount of lead acetate taken is unknown, but it is almost certain that we can eliminate any source of exposure to lead other than the therapeutic use of it for a chronic diarrhea. J. D., aged 53, male, white, was born in Philadelphia, and was a teamster by occupation. He had had gonorrhea ten years ago; malaria four years ago; and an eruption on his body one year ago. He was admitted to the medical wards of the Philadelphia Hospital, August 28, 1905, on account of chronic diarrhea; he complained of pain in his abdomen and of tenesmus. The physical examination showed the heart and lungs to be normal, the abdomen to be tense and rigid but with no points of special tenderness. There was a marked blueline on the gums. The urine contained a few light granular casts, numerous hyaline casts and a small amount of albumin. The temperature, pulse, and respiration were normal, the pain in the abdomen was very severe for a few days and required local applications as well as a general sedative. The diarrhea of which he had complained before coming to the hospital was not present during the month he was in the ward, and in fact the nurse's records show that he had but one stool a day in spite of the fact that he was being given magnesium sulfate for the purpose of eliminating the lead. On September 15, the pain in the abdomen had gone and he was in fairly good condition. He showed no signs at any time of paralysis. Several examinations of his blood showed basic granulation of the red cells in large numbers. No gastric analysis was made. On questioning the man about his former occupation, to ascertain the possibility of his having come in contact with lead in one form or another, I found that he had practically all his life been a teamster, working chiefly in the country and had never handled paint or lead in any form. I then made inquiries in regard to his previous medical treatment and learned from him that he had been in the St. Agnes Hospital for seven weeks, shortly before he came to the Philadelphia Hospital; and on looking up the records of his treatment at St. Agnes Hospital, I learned that only during the last week of his stay there, had he had any lead, and this had been only ½ gr. of the acetate three times a day. On making further inquiries from the patient it was found that he had been to a physician who kept a drug store and who had given him

a liquid medicine for the diarrhea. This physician when I saw him, remembered the patient very well and said that he thought he had given him a prescription containing lead acetate, of which the dose contained 1 gr., as this was a favorite remedy of his. This bottle had been refilled several times during the summer and this same physician had given the patient also some pills, but did not remember whether they contained any lead or not. The small doses of lead acetate which the man received at St. Agnes Hospital, amounting to about 4 gr. or 5 gr. in all, of course had nothing to do with the occurrence of the poisoning, but the other prescription given by the drug store physician was undoubtedly the cause; and as each dose contained 1 gr. of lead acetate and the patient perhaps took more than three doses a day, as he was suffering a great deal during the summer months with severe diarrhea, having on an average, so he said, about ten stools a day, he probably in all took several drams of lead acetate. Thus the total amount was about the same as Dr. Arneill's patient consumed, 2 dr. to 2½ dr. of lead acetate in five or six weeks.

These two cases would indicate that some caution should be observed in prescribing lead as a remedy and suggest the possibility of an extremely severe case of plumbism arising from the therapeutic use of this drug in large doses, or over long periods.

UNUSUAL CASE OF TYPHOID FEVER IN AN INFANT

BY

W. E. DORAN, M.D.,
of Colon, Mich.

To the Editor of American Medicine:—I desire to place on record an unusual case of typhoid fever in an infant of 4 months:

All calls were made at about 10 a.m. except when otherwise marked. The baby weighed 12 pounds at birth and was the sixth child. The mother suffered from great quantities of gas in the stomach and bowels while she was carrying the child. The baby has not been very rugged since birth. October 12 the baby was taken to Orland, Ind. While there a case of so-called typhomalaria developed in the same house where the baby was staying. I was called on October 27, 1905, and found the baby crying and apparently in great distress. The bowels were loose and the baby would rest for a short time after each movement of the bowels; the stools were dark green in color and contained undigested milk. Temperature in axilla 103°; feet and hands were cold. Baby's age 3 months, 9 days.

October 29, temperature was 104° and the bowels moved 3 times; less pain was present. October 30, temperature 103°, bowels moved 2 times. October 31, temperature 103°, bowels moved 2 times; small macules appeared on the abdomen. November 1, temperature 102.5°; macules all over the body. November 2, temperature 102°; child inclined to play a little, stools still greenish and containing undigested milk. November 3, temperature 103°; child irritable. November 4, temperature 104°; eruption fading, right hand twitching; in the evening the condition was about the same. November 5, temperature 104.6°; right hand moving almost constantly. Afternoon temperature 106°; right hand continually moving, pupils widely dilated, head thrown from side to side; child almost in stupor, from which it would wake with sharp cry; no movement of bowels. November 6, temperature 103.2°; the same symptoms continued until the bowels moved, after which an improvement was noticed. Afternoon temperature 104.5°. On November 7 temperature was 102.4°, and the child was much better. After this date the temperature gradually went down to normal, and there was a steady improvement, recovery being very rapid.

A test made on November 20 gave a positive reaction. The mother has never had typhoid. During the entire period of the illness the baby was nursed from the mother's breast. The temperature was always taken in the axilla.

DEVICE TO OVERCOME A SANITARY DEFECT ON RAILROADS.

BY

FREDERIC GRIFFITH, M.D.,
of New York City.

From a leading native physician I learned that Hollanders "die like sheep" from typhoid fever "and don't know what ails them." How much the surface and subsoil canal drainage is responsible for this state of affairs in the little Dutch monarchy it is not necessary for me to demonstrate. One method of dissemination of this disease which makes Holland a vast culture medium for the typhoid fever germ is found in the railway car open closet. What is true of this disease is likewise certain in tuberculosis elsewhere. While every passenger coach abroad is not equipped with the ever-necessary toilet room, in the United States a car without this convenience is practically unknown. The standard closet consists of an ordinary single-trapped or open hopper, leading directly on to the road-bed just outside the rails. The only precaution is in the form of a sign directing the passenger to refrain from using the closet when the train is hauled up before a station. A sufferer from tuberculosis traveling from New York to Colorado will in certain stages of the disease, have frequent bowel movements; a typhoid fever patient the same. Such individuals act as universal distributors along the ground, of the germs from the ravages of which they suffer. Aside from these two forms of ailment, the mode of dissemination of which may be readily traced, there are other diseases, as in the various forms of nematode parasites which affect man. Their transfer to necessary soil or ground-air medium during one stage of development might be explained by this heedless broadcasting of poisons from the human body over the country. As a corrective measure I would propose that every railway closet-hopper be closed. This may be accomplished by means of a suitable-sized metallic receptacle suspended beneath the car body. At division stops the cans may be changed or cleansed and their contents disposed of in the terminal sewers. The car receptacle may be made stationary and fitted with a pipe and valve below and a flushing pipe above. At the end of a run sewer connection may be made at the depot similar to that used in air-brake pressure reservoirs, and the box thoroughly flushed. These devices if carried out will do away with a flagrant dereliction in public sanitation. Preventive medicine is more valuable than "curative" for it is more certain in result.

EDIBILITY OF ANIMAL SPLEENS.

BY

J. M. TAYLOR, M.D.,
of Boise, Idaho.

To the Editor of American Medicine:—I notice in your issue of February 10 an article by Dr. Williams regarding the edibility of animal spleens. He certainly could never have enjoyed a proverbial "hog killing time," or he would have known that fresh spleens, or "melts," as they are called by the laity, are considered delicacies along with "sweetbreads" and fresh sausage, at least in the South and Middle West, where farmers kill enough hogs at one time to supply lard and bacon for the year.

ORIGINAL ARTICLES

THE PROPHYLAXIS OF LOBAR PNEUMONIA.*

BY

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College, etc., Philadelphia.

The subject of the prevention of lobar pneumonia is one that is receiving, and deservedly so, an increasing share of professional thought and investigation. Although the natural methods of diffusion of the pneumococcus are imperfectly known, the report of the Medical Commission for the Investigation of Acute Respiratory Diseases of the Department of Health of New York contains the results of investigations that tend to throw fresh light on this important problem. Until the present, purely empiric prophylactic measures have been for the most part advised and more or less generally employed. The results of experimental studies on the pneumococcus, which have been carried out under the direction of Drs. William H. Park and A. W. Williams, confirmed the opinion previously held by most authors that pneumonia should be considered to a certain degree as contagious. Another fact indicated by these researches was that the virulence of the pneumococcus may be rapidly increased for a susceptible species of experimental animal by successive passage.

It is generally believed that the principal source of the causative organism is the sputum of pneumonia patients, but since the virulence of the pneumococcus may be quickly increased, as shown by the results of the investigations of Park and Williams, and since the organism is quite prevalent in normal sputum, the latter source must be reckoned with in considering measures of prophylaxis. Unquestionably, however, the virus is transmitted from infected persons principally by the dried sputum and there can be no doubt that it is often harbored not only in the nasopharynx of healthy persons, but also in private houses and institutions occupied by pneumonic patients. Wells examined the secretions from the respiratory passages, oftenest from the throat, in 135 persons and found the pneumococcus present in 62, or 45%. He points out that "the pneumococcus-laden secretions from these parts extruded in such manner that they find entrance, as spray or dust, into the respiratory passages of other and unaffected persons." It may be safely assumed that direct transmission of the virus (contagion) as exemplified in house epidemics may occur.

My own previous investigations into the subject of the incidence of pneumonia led to the inference that the prevalence of the disease is much influenced by indoor conditions, especially such as obtain during the cold season. A study of "The Meteorologic Conditions in the Causation of Lobar Pneumonia"¹ suggested that the higher incidence of pneumonia in winter and in spring was probably due not so much to the direct effect of the low temperature and augmented barometric pressure

and velocity of the winds as to the closer confinement of the populace indoors in the stagnant air of living-rooms, from which the sunlight is excluded, and which tends to lower vitality and decrease resistance on the one hand, and to favor rapid multiplication and increased virulence of the specific poisons on the other.

This view was corroborated by collective investigations, which showed that there is an evident tendency to a preponderating prevalence of the disease in overcrowded districts and among the impoverished classes. It was found that the average mortality-rate for four years in New York (considering the eight wards which are most densely populated) is 18%, while eight wards, representing more sparsely settled portions of the city of New York (*e. g.*, first, fifth, eighth, ninth, fifteenth, sixteenth, eighteenth, and nineteenth) for the same period of four years gave an average mortality of 14.3%. It was also observed in the compilation of these mortality statistics that an elimination of the epidemic periods would make the difference in percentage dependent on the population somewhat greater still.²

In this connection the results of experiments of Longcope and Fox³ should be briefly presented. They indicate that the percentage of the true pneumococcus type of organism is not to be found constantly in the mouths of 40% or 50% of healthy individuals, as might at first appear from their tables. Thus, in November the percentage is small, while in December and January it increases enormously, "to fall again gradually to a low level in March and April." The results further suggest that during the winter months, especially December and January, or the pneumonic season, the pneumococcus has a widespread distribution. That absence of sunlight and abnormal dryness of the atmosphere favor diffusion of the virus is highly probable. It must be confessed that the medical profession is still sadly in need of definite information bearing upon the extracorporeal phases of the pneumococcus and its transmitting agencies.

It is now generally conceded that implantation may result from the migration of the pneumococcus contained in the secretions of the upper air-passages down to the alveoli, from the inhalation of particles of dried pneumonic sputum floating in a dusty atmosphere (common) and in the act of coughing, salivary droplets conveying the virus to the bystander or attendant. While most cases of lobar pneumonia occur among persons coming into more or less intimate contact with sputum containing the pneumococcus, the question of individual predisposition is scarcely subsidiary in point of importance. Notwithstanding the fact that the average duration of life has been distinctly lengthened during the last quarter of a century, and there is on the whole greater physical efficiency and a higher bodily standard, as compared with former periods of like duration, a few diseases, including pneumonia, carcinoma, affections of the kidneys, and cardiovascular degenerations (fatty and fibroid), are known to be notably on the increase.

These conditions most probably predispose to pneumonia, as shown by my own collective investigations into the subject.⁴

Predisposition is also engendered by imprudent exposure, by age, alcoholism, acute or subacute catarrh of the

* Read before the Medical Society of the Greater City of New York, December 11, 1905.

nasopulmonary tract, by traumatism, and in other ways. From the foregoing facts it is obvious that effective prophylaxis embraces four main objects: (a) The thorough disinfection of pneumonic sputum as well as that of healthy persons, including the secretions of the upper air-passages; (b) isolation of the patient, especially from the debilitated, and disinfection of the sick chamber, together with its contents after death or recovery; (c) the removal of personal predisposition, and (d) the introduction of certain public measures.

(a) Thorough and prompt sterilization of pneumonic sputum and of the secretions from the upper respiratory tract and then promptly destroying the same by burning is a matter of the utmost importance. Certain writers have warmly advocated that the sputum be discharged upon rags, which are to be burned while yet moist. Since this method affords abundant opportunity for soiling the bed-linen and body-linen as well as other objects, and thus facilitating the diffusion of the pneumococcus, I would strongly advise against it. The sputum that clings to the mouth, teeth, or mustache of the patient, as well as that which may accidentally soil the body-linen or bed-linen at the time of expectoration into a spit-cup containing an efficient disinfectant, should be wiped with a cotton or other suitable cloth, moistened with a disinfectant solution and then quickly burned.

In persons known to harbor the pneumococcus, Wells "recommends that a cloth moistened with a disinfectant solution should be held before the nose and mouth during the acts of coughing and sneezing to prevent transference of the virus." Perhaps a more effective mode of dealing with these subjects would be to sterilize and disinfect the upper respiratory tract and oral cavity in a systematic manner. As stated in a previous article, "I consider the question of thorough disinfection of the sputum, the bed-linen and body-linen, the mattress and room occupied by the pneumonia patient, a prime requisite, but I have a fixed belief that these matters, like the sputum, do not receive the rigid care and attention which they richly merit by the average general practitioner, and it may require municipal regulations to carry out certain measures that are more or less preventive of the spread of the disease."⁵

Since the publication of my former paper I have been pleased to note that steps have been taken by the Commissioner of Health of New York to prevent the use of pavements as public spittoons.

(b) Isolation of pneumonia patients is to be advised and encouraged, all progressive clinicians being at date of writing of the opinion that the pneumococcus is directly transmissible. It is highly probable that house epidemics, which are not uncommonly observed, are spread by contagion. It is the physician's right no less than his duty to isolate cases of lobar pneumonia, and rooms that have been occupied by them are to be regarded as centers of infection until thoroughly fumigated with formalin or other approved agencies after death or recovery.

(c) The removal of bodily receptivity to the pneumococcus infection is a prime requisite in our effort to limit the dissemination of the disease. Important as this phase of the subject really is, I shall be compelled owing to the exigencies of time and space, to voice a few

conclusions rather than enter upon its full discussion. In the first place, careful, judicious "habituation of the body to cold air and cold water" constitutes an efficient prophylactic measure. *Per contra*, prolonged exposure during inclement seasons or after bodily fatigue has a predisposing influence, especially in the aged and debilitated. These subjects should also use a tonic composed of "strychnin, quinin and gentian" during the pneumonia season—winter and spring. The ordinary "colds" and all forms of catarrh of the respiratory tract should be energetically and promptly treated especially during the cold season.

In this connection, the removal of nasal obstructions which induce mouth-breathing during sleep, thus favoring the migration of pneumococci to the air-cells, is a matter of first importance. Again, granting that the increasing prevalence of visceral degenerations, particularly of the cardiovascular system and the kidneys, may account in some degree at least for the increasing prevalence and morbidity of lobar pneumonia, it follows that successful prophylaxis must begin with a change of the habits of the American people. The social characteristics and customs and strenuous methods of business activity need to be radically improved in order to enable the predestined victim of lobar pneumonia to escape his sad fate. I deeply regret that time and space prevent a consideration of the question in all its bearings.

In general, life in America is becoming more complicated and in a certain sense more dissipated. From various sources facts are readily gathered which furnish a basis for generalization to the effect that there is an increasing tendency to club-life and luxurious living in this country. These social conditions tend to impair individual health and vigor as well as the "personal equation," predisposing to the affections already enumerated, which hold a causative relation to lobar pneumonia by inducing connective-tissue overgrowth.

In the various degenerations referred to before, of the heart, bloodvessels, and kidneys, which are slowly but steadily progressive as a rule, our efforts must be directed toward the maintenance of the highest degree of nutrition attainable by hygienic and dietetic means. Much may be gained by correcting irregular habits of body, immoderate exercise of mind, the regulation of passionate emotions and appetites. Alcoholic drinks are to be eschewed, as a rule.

(d) Boards or Commissioners of Health should issue systematic details connected with the subject of the prevention of lobar pneumonia and also state in simple, plain facts about the way in which the disease is spreading. Indeed, all practitioners of medicine should be provided with copies of carefully prepared regulations and it should be obligatory upon them to carry out the instructions of the health authorities. Unquestionably the matter is of sufficient importance to compel the most serious attention to the subject on the part of all—sanitary boards, the medical profession, and the laity. The populace should thoroughly understand that the heavier alcoholics are deleterious in their influence, lowering resistance to infection during the pneumonia season.

The general public should be enlightened by State

and Municipal Boards of Health with reference to efficient ventilation of our office buildings, theaters, courts of justice, manufacturing establishments, churches, public schools, and passenger and street railway cars. In all of these places in which persons habitually congregate infectious diseases, including pneumonia, are apt to be propagated.

As stated elsewhere, "it should be the duty of Bureaus or Boards of Public Health to look after street-cleaning and street-sprinkling, and to them should be given full executive authority. It requires no lengthy argument to indicate conclusively that this important work naturally forms a portion of the sanitary administration of our municipalities. The hygienic requirements of a city can only be met by a system of street-cleaning and automatic sprinkling under the immediate charge of specially trained health authorities. In conclusion, we must look to the possibility of a successful municipal control of an effective prophylactic system."⁶

As before intimated, it is gratifying to observe that the Commissioner of Health of New York has issued a drastic edict against spitting on the sidewalks, and that already a decrease in the number of cases of pulmonary tuberculosis has been noted in certain districts in which the law has been enforced. What is true of pulmonary tuberculosis applies with undiminished force to lobar pneumonia, since the itinerant cases of the former find their counterpart in well persons or those suffering from catarrhal conditions of the respiratory tract, who harbor the pneumococcus.

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⁴ "Social Conditions in America in Their Relation to Medical Progress and Disease," *Jour. Am. Med. Assn.*, May 9, 1903.

⁵ The Prophylaxis of Lobar Pneumonia, *The Medical News*, June 3, 1905.

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IMPERFECT DESCENT OF TESTES.

BY

ANGUS McLEAN, M.D.,

of Detroit, Mich.

The distinction of sex is perceptible at the end of the seventh week of gestation. The testes develop from the genital ridge of the wolffian body, the wolffian duct becoming the vas deferens. The testes in early intrauterine life lie extraperitoneal and just below and in front of the kidneys. At about the third month the gubernaculum testis appears as a slender band extending from the internal ring to the body and epididymis of the testis, with a process extending upward toward the diaphragm, the latter ultimately containing the spermatic vessels. The former at the end of the sixth month can be traced through the inguinal canal to the pubes, and finally to the bottom of the scrotum; these portions guide the testis to its final position. The testis in its normal descent passes into the inguinal canal during the seventh month of gestation and into the scrotum during the eighth month.

This organ may be arrested at any point in its normal descent (cryptorchismus) or may take an aberrant direction. Anomalies of migration are usually of the following direction: It may pass the external ring and descend into the perineum; may be found about the root of the penis; or another channel of aberrant descent may be by the way of the femoral canal, the testis being found in the locality of the saphenous opening. These anomalies have been attributed to misplaced portions of the gubernaculum testis; abnormal fibers of the gubernaculum may extend into the perineum to the root of the penis or through the femoral canal and draw the testis into one of these aberrant positions. Some anatomists do not attribute this function to the gubernaculum.

Undescended testes are usually retained at one of the following locations: Within the abdomen, in the inguinal canal, and immediately outside of the external ring.

The causes given for their arrest are as follows: Adhesions incident to prenatal peritonitis (curling), maldevelopment of the mesorchium, shortness of the vas deferens, constrictions in the course of descent, conditions associated with the cremaster, external pressure, as from the wearing of a truss and hereditary predisposition. In support of this last named cause I wish to mention the hereditary history in connection with three of my cases:

Mr. H., aged 20, had a bilateral inguinal retention. Father was a heavy man with an effeminate appearance; he lived to be 60, but never had beard enough to require shaving. His brother had double inguinal hernia and his mother a femoral hernia.

Master R., aged 9, double inguinal retention. Two paternal uncles; one had a hypospadias, the other a deformed constricted prepuce. Maternal uncle had double retained testes and became mentally deranged at the age of 25 from worrying over his defect.

Mr. W., aged 18, unilateral abdominal retention. Paternal uncle had a hypospadias.

I personally verified these histories and they clearly demonstrate the hereditary anatomic and masculine defects of the patients' relatives, showing a predisposed anatomic weakness of the sexual apparatus.

Retained testicles are usually undersized, and in adult life show on microscopic examination degeneration and atrophy of the secreting structures. They are also functionless, so far as reproduction is concerned, no spermatozoa being found in these organs or their ducts.

Bilateral retention of the testes does not interfere with development, for the subjects of this misfortune have all the characteristic appearance of the male sex and in no way differ from their brothers, excepting that they are not capable of procreating the species. The testes not only perform the function of reproduction, but develop masculinity, for when the testes are absent or removed at an early age the person does not develop the characteristics of the male, but acquires the physical and mental attributes of the eunuch.

In unilateral retention there is little to be anxious about, for one perfect testicle will suffice for reproduction.

Bilateral inguinal retention is a condition demanding consideration. If the testes are left in their retained position, not only is sterility certain to follow, but in their exposed condition they are predisposed to trauma-

tism, inflammatory attacks, and frequently become the seat of malignant disease. Normally, the testes should enter the inguinal canal during the seventh month, and pass into the scrotum during the eighth month. Frequently they do not completely descend until after birth, and may occasionally be retained in the inguinal canal until puberty and then descend into the scrotum. Comparatively few of these testes descend at puberty, and it is a question if their sperm developing power has not been impaired by that time.

The question arises as to the age at which it is best to interfere. No general rule has been established, but it is wise to wait until the third year. A large percentage of the inguinal and inguinoscrotal variety is accompanied by hernia, while the abdominal variety is less frequently the seat of this complication.

The only satisfactory results obtained in the treatment of this defect has been by transplantation. A few writers have advocated manual traction, but none seem to have met success, and this may give rise to serious consequences. The radical method in many cases gives a very satisfactory result, and adds much to the mental and physical condition of the patient.

The prognosis should always be guarded, for it is impossible to foretell the anatomic condition until the organ has been exposed, as some of the portions of the cord are absolutely necessary to the function of the testicle, namely, the vas deferens and the blood supply. If the former important structure is not of sufficient length to allow the testicle to be retained within the scrotum, the organ should be removed or placed in the abdominal cavity. When the vas deferens is only slightly shortened this difficulty may be overcome by separating the duct from the body of the epididymis, and the globus minor from the body of the testicle; the latter can be easily performed, for there are no ducts or bloodvessels entering or leaving from this point, the attachment being formed by the reflection of the tunica vaginalis. This will gain from one and one-half inches to two inches in the length of the vas deferens without interfering with the function of the testicles. When the spermatic artery is short, little can be done to lengthen it, as it does not follow the course of the vas deferens.

The branches supplying the testicle enter its upper portion, while other branches supply the epididymis, anastomosing with the branches of the vas deferens and cremasteric branch of the deep epigastric.

The direct blood supply through the spermatic artery should be maintained when possible, but it may be severed if necessary, the circulation being carried on through the anastomotic branches. I have seen this done on several occasions without any apparent ill results. I shall report four cases of different types of which I was able to get a photograph some time after the operation.

CASE I.—Mr. H., aged 20. In this patient the testicles were firmly fixed in the lowest wall of the inguinal canal and were accompanied by double inguinal hernia. The hernial sac passed over the testes and extended slightly into the scrotum. An incision was made over the line of the canal and external ring and carried down to the hernial sac, which was dissected up and with it the testicles and cord. The testis was somewhat smaller and softer than it is normally, with the posterior layer of

the sac forming its anterior covering. The sac was freed up to the internal ring, severed, and approximal portions disposed of as in the operation for hernia. Enough of the distal portion of the sac was left to cover over the testis and was so stitched as to form a tunica vaginalis; the cord was freed and brought down as far as possible, but was not of sufficient length to allow the testis to hang free in the scrotum. The vas was separated from the body of the epididymis and the globus minor and a portion of the body of the epididymis was carefully dissected from the body of the testicle for over one-half inch and the tunica of the separated portion stitched. This can be easily and safely done, for there are no bloodvessels entering or ducts leaving the testis at this point; the structures are held together by cellular tissue and a reflection of the tunica vaginalis. This made about one and one-half inches difference in the length of the cord and allowed the testis to hang full over the crest of the pubis into the scrotum, the areolar tissue of the latter being separated so as to form a pocket. The floor of the wound was closed and small ligatures were passed

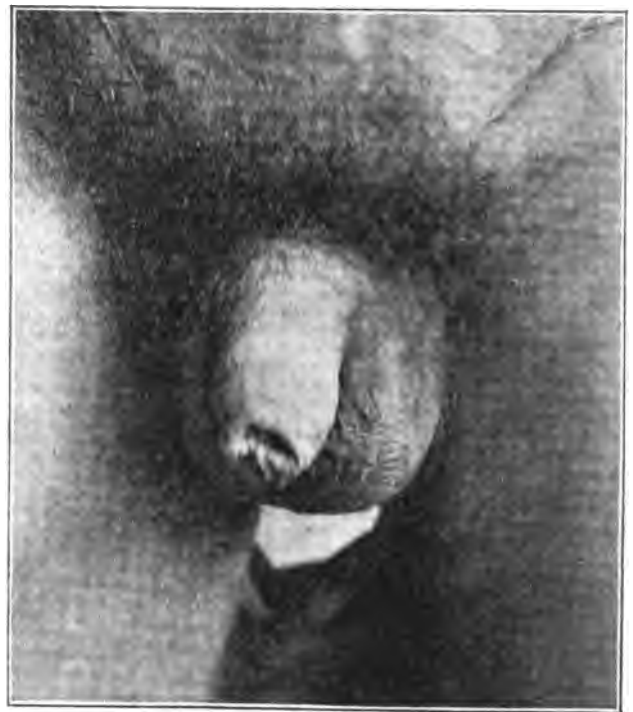


Fig. 1.—From photograph taken two years after operation.

through the fibrous tissues of the cord and then fastened to the margins of the external oblique muscle. The external wound was closed in the usual way; the same procedure was gone through with on the opposite side. A rubber band was placed around the base of the scrotum sufficiently tight to constrict it and crowd the testicles to the lower portion, and a dressing applied. He made a splendid recovery, the hernia being perfectly cured and his testicles resting free and easy in the scrotum. He has since married, but two years later had no offspring.

CASE II.—Patient, aged 6. There were no complications, both testicles could be felt in the upper portion of the inguinal canal. He would often come to his mother complaining of pain in this region after playing or running hard. Excessive muscular action evidently produced a pressure on these delicate structures that was followed by a congestion. An incision one and one-half inches in length along the outer margin of the external ring having been made and the ring opened, the testis could be forced down by external pressure, so that it could be seized at the ring and pulled out of the opening;

the cord was freed by a blunt dissector and traction made on it until it was of sufficient length to allow the testicle to pass into the scrotum. Ligatures were passed through the fibrous coat of the vas as high up as possible and the ligature made fast to the pillars of the external ring. Both sides were operated on in a similar manner and the wounds closed and the rubber band placed around the base of the scrotum. This boy made a good recovery and had no trouble following.

CASE III.—Mr. G., aged 16. Patient saw no appearance of right testis at any time. An incomplete inguinal hernia appeared at the age of 16, for which he sought relief and was advised to have it operated upon. At the time of the operation the testicle was discovered at the internal abdominal ring fairly well developed. On inspection the vas deferens was found to be coiled upon itself, forming 4 or 5 spirals about $\frac{1}{4}$ inch in diameter. The fibrous tissue was freed from the vas and, as the vas was straightened

to assist in keeping the testis forced into the scrotum. The wound was closed as in a hernia, Ferguson's method. The testis in this case did not hang so free as the other, but hung well over the crest of pubis. The photograph from which the cut was obtained was taken three months after the operation.

The following conclusions may be drawn from the cases I have had:

1. In many cases of undescended testes there is an hereditary anatomic weakness of the sexual apparatus.
2. There is no way of telling before exposure whether the cord will allow of the transplantation of the organ to the scrotum or not.
3. An inch or more can be added to the vas by separating it from the epididymis and the globus minor from the body of the testis.
4. The spermatic artery may be severed and the vitality of the organ maintained.



Fig. 4.—Case IV.



Fig. 2.—Case II. Taken six months after operation.

out, it was of sufficient length to allow the testicle to hang free in the scrotum, as shown here in cut reproduced from picture taken one year after operation.

CASE IV.—Patient, aged 21. There had been no descent of the testis on the right side. He had developed pain in the right inguinal region and consulted his physician for relief, who discovered an enlargement in the inguinal region and diagnosed it as hernia; gave him an anesthetic and tried to reduce it by taxis, but was unsuccessful. This was evidently a case in which the testis was retained in the canal since boyhood.



Fig. 3.—Case III.

I operated upon him and found the cord short and lengthened it as in the first case, by separating the globus minor from the body of the testis. The spermatic artery was short and had to be severed, but this did not interfere with the vitality of the organ, as the anastomotic circulation was sufficient. The vas was well drawn down and fastened to the pillars of the external ring by a ligature passing through its fibrous coat; a rubber band was placed around the base of the scrotum

TWO RARE FORMS OF CYSTITIS, WITH REPORT OF CASES.¹

BY

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It is not my intention in this paper to take up the more common forms of cystitis, but simply to report two cases which seem very typical of two of the rarer forms of this disease. In a general way, however, it may be of interest to review some of the recent literature in regard to the etiology of this condition. That cystitis is always of bacterial origin is now an accepted fact. Some of the most frequent microorganisms setting up an inflammation of the bladder are *B. lactis aerogenes*, *B. urobac. liquefaciens*, the gonococcus, the tubercle bacillus, the typhoid bacillus, and some of the microorganisms belonging to the proteus group. The fact that mixed infections are very frequent is well known. An interesting fact in regard to the bacteriology of this condition is that the mere presence of bacteria, even of the most virulent type, is often not sufficient to set up an inflammation; however, the presence of bacteria in conjunction with a slight trauma, such as might be produced by catheterization, is sufficient to set up a cystitis. A condition has been described by Goldberg and also by Krogus and others in which the urine swarms with bacteria and in which there is no evidence of inflammation of the bladder. This condition has been called "bacteriurii." The mode of entrance of the microorganism to the bladder is usually through the urethra; it may also be a descending infection from the kidney. Raymond has called attention to the comparatively large number of cases of cystitis occurring in women who are

¹ Read before the Obstetrical Society of Philadelphia, February 1, 1906.

suffering from pelvic inflammatory disease. He believes that many of these are not infected through the urethra, but through a direct infection from the inflamed tubes and ovaries. To prove this he injected pure cultures of microorganisms into the peritoneal cavity of dogs, and at the same time passed a ligature around, tying off the urethras, and one hour after this he found the bladder inflamed and recovered the original microorganism in pure culture from it. This fact has been confirmed by numerous other experimenters; however, as has been pointed out by Roberts, it is hard to rule out the possibility of blood infection. The practical side of these experiments would seem to be that catheterization should be performed as rarely as possible, and only with the greatest care in patients known to be suffering from active pelvic inflammatory disease or other infective conditions. The exact etiologic relation between bacteria and stone in the bladder is a difficult question to solve. A number of cases have been reported in which microorganisms have been found in the center of vesical calculi, and it has been thought that the bacteria formed a nucleus for the stone, as it is well known that they do in biliary calculi; it must be admitted that this is difficult to prove absolutely. It is, however, certain that any foreign body introduced into the bladder will soon become coated with urinary salts; numerous such cases have been reported; catheters, sutures, pencils, hair-pins, and other articles have been found forming the nucleus for a stone. The following is a good illustration of the above-mentioned type of cases, and occurred at the University Hospital in the service of Dr. John G. Clark, to whom I am indebted for the privilege of reporting it:

Gyn. No. 1,066.—Patient, aged 32. Married, white. The previous history is unimportant. Three years before coming to the University Hospital she began to have the symptoms of cystitis. These became progressively worse in spite of the most careful treatment by her family physician, and at the end of one year the patient was in a most desperate condition, and a suprapubic cystotomy was advised and performed by an out-of-town surgeon. This relieved her symptoms very markedly, and at the time of her leaving the hospital, where the operation had been performed, the only remaining symptom was a sense of soreness over the bladder. A few days after leaving the hospital, however, her old symptoms began to return, and one week after leaving the hospital, or about five weeks after the cystotomy, she passed a large silk ligature covered by urinary salts. Since then, or for the last two years, the symptoms have continued, and at the time of admission to the University Hospital she complained of aching sensation over the bladder, which was almost constant, but somewhat relieved by rest, much accentuated by micturition. The slightest jar or shock caused intense pain, the stream of urine was occasionally interrupted as if by an obstruction. The urinalysis showed the urine yellow, cloudy; sp. gr. 1,080; heavy mucoid sediment one-fifth volume, strongly alkaline, and a trace of albumin. The microscope showed pus, triple phosphates, and urates. Cystoscopic examination revealed a moderate-sized stone suspended from the anterior wall of the bladder, and a somewhat undermined ulcer slightly posterior to the point of attachment of the stone. The entire bladder was much inflamed. A vaginal cystotomy was performed and the stone removed. The stone is somewhat spherical in shape, slightly flattened on two opposite surfaces, is rather rough in consistency, and has been

formed about a heavy silk ligature, which also formed the means of suspension. A note one week after the operation says the patient has no pain and the wound is healing somewhat smaller. Thirteen days after the removal of the stone the vesicovaginal fistula was closed under local cocaine anesthesia with catgut sutures. The patient made an uninterrupted recovery and was discharged cured four weeks after the operation. The treatment after the first few days following operation was daily irrigation of the bladder with boric acid solution and urotropin by mouth.

The interesting features of this case are that the time taken for the formation of the stone can be definitely stated two years, and that the stone was suspended in the bladder and in such a location that in certain positions it could partially block the urethra; it also shows how quickly even a severe cystitis, when caused by a definite irritation, will subside when the cause of irritation is removed. It is not necessary to dwell on the importance of not penetrating the vesical mucosa in all operations about the bladder.

The second case is one of exfoliative cystitis, which occurred at the Howard Hospital in the service of Dr. John B. Shober, and has been included by him in the report of a large series of cases of cystitis; but as the condition is rather a rare one I have thought that a detailed description of the case might be of interest:

Patient, aged 32, married, colored. She first presented herself at the Gynecological Dispensary eight weeks



Stone in the bladder formed about a heavy silk suture (actual size). Gyn., No. 1,066.

ago; at this time she was suffering from all the symptoms of acute cystitis. There was no evidence of gonorrheal infection about the genitalia. She was admitted to the wards and under ether anesthesia a thorough examination was made. The uterus and appendages were normal, the uterus being in anteversion. Cystoscopic examination revealed the bladder somewhat contracted, the entire mucosa reddened, thickened, and numerous hemorrhagic areas over the surface; the base and trigone were most affected; no actual ulcers were present. The urine at this time was cloudy, 1,028; alkaline, and showed a marked trace of albumin; there was a heavy reddish sediment about a quarter by volume, which the microscope showed to be made up entirely of red blood-corpuscles. A bacteriologic examination showed a pure culture of a very virulent colon bacillus. The treatment consisted of rest in bed, milk diet, urotropin and salol by mouth, and daily irrigation of the bladder; as the acute symptoms subsided, 2 oz. of a 5% solution of silver iodid was introduced into the bladder once a day at the conclusion of the irrigation. The patient improved rather slowly, but after two weeks of treatment was feeling so much better that she was allowed to go

home. The urine by this time had cleared up markedly. The patient was to return to the dispensary every other day for treatment. This, however, she neglected to do. She returned one week after her discharge from the hospital; at this time the urethra was blocked by a sloughing mass as thick as a lead-pencil, and about four inches of which was outside the external urinary meatus. The bladder was much distended and she had been unable to pass urine for 14 hours. With some difficulty an entire cast of the bladder was removed, followed by a gush of urine. Since then the patient has been under constant treatment and is now nearly well. The bladder is somewhat contracted, but under dilation, as recommended by Young, is dilating satisfactorily. I think that in a short time the patient will be entirely well. The cast represents the entire mucosa of the bladder, and under microscopic examination shows a part of the muscularis to be present. The entire specimen is undergoing necrosis.

Exfoliative cystitis is often found associated with a retroverted pregnant uterus and usually manifests itself at about the third or fourth month; about 50% of the cases are due to this cause. Other causes are a retroverted myomatous uterus, or a myoma choking the pelvis; protracted labor, or the instillation of very strong irritating solutions. None of these etiologic factors was present in the case foregoing.

Exfoliative cystitis usually begins with an abrupt onset. In view of these facts and close relationship between the blood supply of the cervix and the bladder, it would seem that the condition is one of ischemic necrosis. In the majority of cases of exfoliative cystitis the mucosa is thrown off in shreds. Bolt has established three grades of this condition, according to how many of the coats of the bladder are involved. The prognosis of these cases is usually favorable, except in those cases associated with sepsis. The treatment is that usually adopted for cystitis after having corrected any displacements that may be present and restoring the blood supply of the bladder as nearly as possible to the normal.

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REPORT OF A STUDY OF THE CONRADI-DRIGALSKI MEDIUM FOR THE ISOLATION OF *B. TYPHOSUS*.

BY

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In order to become familiar with the medium as prepared by Conradi and Drigalski and the appearance of the colonies of *B. typhosus* upon it, some time was devoted to the study of the appearance of colonies of known laboratory cultures. Also, the medium was prepared in different ways and containing varying quantities of the constituents, the object being to become familiar with the medium and to determine the shortest possible time in which it could be prepared.

The medium as originally prepared was found by Eyre to be "variable in composition, reaction, color, and the macroscopic appearance of the organisms growing upon it." He recommends the preparation of the medium by a method which he has devised in order to insure a more constant product. In the preparation of this medium much more time is consumed. Special apparatus for titrating and combining the ingredients was required, so that it was found to be an impracticable method for our purpose, and the advantages were not commensurate with the time and extra apparatus necessary.

Clarification before filtering is not mentioned in the directions given by Conradi and Drigalski.² It was found that by the use of the whites of four eggs well beaten up with water, slowly added after the medium had been cooled to 60° C. and then boiled gently for 36 minutes, filtering was facilitated and a clearer product obtained. So far as could be determined from the appearance of the typhoid colonies upon the medium, no change of the properties of the nutrose was perceived. The material used for our investigations was obtained from various hospitals in Washington, and the Army General Hospital. As there were only one or two cases of typhoid fever at the Army General Hospital, dependence had to be placed upon the willingness of the officers of the civil hospitals to assist in furnishing the material. As the supply of material fluctuated the number of transfers taken from each plate varied according to the time at our disposal, and only the colonies which resembled colonies of *B. typhosus* were chosen in any plate. The work was divided systematically into the following four steps:

1. Transferring colonies from plate cultures prepared the preceding day to litmus milk, glucose agar, bouillon, potato, and ordinary agar.
2. Examination of cultures in the different mediums. Slight acidity of litmus milk and no gas formation in glucose agar required further study of the organism in the hanging drop for motility and the agglutination tests with typhoid immune serums, human and rabbit, with all motile organisms. Nonmotile organisms failing to produce gas in glucose agar were tested with anti-dysenteric serum, 1 to 200 dilution. Those organisms which produced a slight acidity in litmus milk with a

blue-green cream ring and gas in glucose agar were cultivated in fermentation tubes containing glucose, saccharose, and lactose, and the quantity of gas measured daily. Upon the third day the gas formula was taken for each organism.

3. Preparation of plates for inoculation. The method pursued was as follows: The medium was poured into

the surface of the plate as to prevent the development of independent colonies. If this precaution is not taken there is a tendency for the colonies to become confluent.

As less care is taken to prevent contamination of the plates during the process of pouring than is usually observed, the continued high temperature doubtless attenuates or destroys many organisms which may have fallen

ORGANISMS.

Case.	Patient.	Number of specimens.			Number of blue colonies.	Widal's reaction.	Week of illness.	Morphology.			Litmus milk.							Gas.				Agglutination.				Designation.
		Stools.	Sputum.	Urine.				Bacillus.	Coccus.	Motility.	Cream ring.				Peptonized.	Decolorized.	Percent.			Form.		1 hr.-1:50 human serum.	1 hr.-1:200 rabbit serum.			
											Blue green.	Pink.	No change.	Acid.			Alkaline.	Glucose.	Lactose.	Saccharose.	H.			CO ₂ .		
1	R. L.	8	1	2	100	+	Fourth and fifth.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	1	
2	H. C. C.	1	.....	.....	4	+	Eighth.	+	+	+	+	+	+	+	+	+	+	25	.....	.....	.....	.....	.....	.....	2
3	Unknown.	.....	.....	2	9	.....	.....	+	+	+	+	+	+	+	+	+	+	.....	.....	.....	.....	.....	.....	.....	3
4	C.	.....	.....	.....	10	.....	.....	+	+	+	+	+	+	+	+	+	+	85	75	5	1	2	.....	.....	4
5	C. B.	9	.....	1	58	+	Third.	+	+	+	+	+	+	+	+	+	+	20	.....	.....	.....	.....	.....	.....	5
6	M.	2	.....	.....	20	.....	Fourth.	+	+	+	+	+	+	+	+	+	+	17	.....	.....	.....	.....	.....	.....	6
7	Mr. B. ¹	12	8	7	120	+	Second to sixth.	+	+	+	+	+	+	+	+	+	+	.....	.....	.....	.....	.....	.....	.....	7
8	P. W.	2	1	1	5	+	First and fourth.	+	+	+	+	+	+	+	+	+	+	.....	.....	.....	.....	.....	.....	.....	8
9	H. H.	.....	.....	.....	12	.....	Third (?)	+	+	+	+	+	+	+	+	+	+	.....	.....	.....	.....	.....	.....	.....	9
10	M. W.	4	.....	2	24	+	Second to fifth.	+	+	+	+	+	+	+	+	+	+	.....	.....	.....	.....	.....	.....	.....	10
11	P. K.	2	.....	.....	6	+	Third.	+	+	+	+	+	+	+	+	+	+	80	.....	.....	.....	.....	.....	.....	11
12	Mr. B. ²	12	.....	5	33	+	Second to sixth.	+	+	+	+	+	+	+	+	+	+	20	.....	.....	.....	.....	.....	.....	12
13	Dr. G.	4	.....	5	35	+	Admitted to hospital 7-12-05. Stools plated to 7-31-05.	+	+	+	+	+	+	+	+	+	+	.....	.....	.....	.....	.....	.....	.....	13
14	Mrs. M.	4	.....	4	25	?	Admitted to hospital 7-12-05. Plated 7-19 to 8-8.	+	+	+	+	+	+	+	+	+	+	.....	.....	.....	.....	.....	.....	.....	14
15	Mr. P.	2	.....	2	12	+	Second.	+	+	+	+	+	+	+	+	+	+	.....	.....	.....	.....	.....	.....	.....	15
16	M. O.	2	.....	.....	10	+	Third after admission to hospital.	+	+	+	+	+	+	+	+	+	+	.....	.....	.....	.....	.....	.....	.....	16
17	R. L.	8	.....	.....	12	+	Admitted to hospital 7-26-05. Plated 7-29 to 8-8.	+	+	+	+	+	+	+	+	+	+	.....	.....	.....	.....	.....	.....	.....	17
18	J. M.	1	.....	.....	6	—	Third.	+	+	+	+	+	+	+	+	+	+	.....	.....	.....	.....	.....	.....	.....	18
19	J. B.	1	.....	.....	4	—	Fourth.	+	+	+	+	+	+	+	+	+	+	.....	.....	.....	.....	.....	.....	.....	19
20	M. S.	2	.....	.....	5	.....	Second.	+	+	+	+	+	+	+	+	+	+	.....	.....	.....	.....	.....	.....	.....	20
21	C. R.	1	.....	.....	5	.....	Fourth.	+	+	+	+	+	+	+	+	+	+	.....	.....	.....	.....	.....	.....	.....	21

* Patient died. † Convalescent. ‡ Litmus milk fading lilac. § No blue colonies appeared until urine was added to bouillon and plated the following day. ¶ Decolorized in 48 hours. †† Isolated from intestinal contents plated at time of post mortem. ‡‡ Slate colored, fading. §§ Gas production not recorded in saccharose and lactose. ¶¶ Slight change not markedly acid. ††† Milk slightly paler blue than before inoculation. ‡‡‡ No blue colonies in plate; patient died.

NOTES EXPLANATORY OF TABLE.

* *B. typhosus* isolated from sputum, urine, and stool in Case 1, spleen in Case 9, and stool in Case 13. At the time of isolation of *B. typhosus* from the sputum in Case 1 the patient had a severe bronchitis.

† Represents *B. faecalis alkaligenes*.
†† Represents *B. cholerae suis*, *B. enteritidis* (Gaertner) or *B. paratyphosus* group.

plates, which were allowed to stand partially uncovered until the steam no longer condensed upon the under surface of the covers. In 15 minutes the agar had solidified and the plates were then placed (uncovered) in a dry oven at a temperature of 60° C. for two or three hours. A firm surface resulted without so much free fluid upon

upon the plate. Although the crystal violet inhibits the development of many of the air organisms, many more were found to develop in plates unincubated than in those incubated after having stood for a few days.

4. Inoculation of the plates: Of liquid stools three loopfuls were placed upon the surface of the medium.

This material was then uniformly distributed over the surface of the medium by means of a sterile bent glass rod, turning the plates simultaneously with manipulation of the rod. The second plate of the series was inoculated by means of the glass rod being carried to it without sterilization. From the second plate the rod was carried to the third. With the amount of material used, the third plate rarely contained more than 30 to 40 colonies of all types of organisms. Of solid stool, a quantity about the size of a pea was added to 5 cc. of normal salt solution and violently shaken until the solid matter was suspended and then allowed to stand for 15 minutes. A series of plates was then made by taking loopfuls of the fluid and inoculating as before.

Plates were made from sputum in similar manner to the method of plating liquid stool.

Urine was centrifugalized and plates made from the supernatant liquid as well as the sediment. Definite quantities of urine were added to flasks of bouillon and after 24 hours' incubation plates were made from these mixed cultures. Numbers of series of plates from each individual specimen were not made.

Because of difficulty in obtaining material and inaccessibility of the patients we were unable to make cultures of blood taken by scarification of rose spots, purulent matter, soiled linen, etc.

The method adopted and described in paragraph 1 is not that pursued by Conradi and Drigalski for isolation of *B. typhosus* from contaminated plates. They examined the organisms composing each blue colony in the hanging drop to determine their motility. If motile, they were tested with typhoid immune serum for agglutination.

For the success of this method one must have available an animal which yields large quantities of typhoid immune serum of high and constant agglutinative value. Such an immunized animal was not available during this work. There were a number of rabbits at the laboratory which were yielding serum varying in agglutinative value - from dilution of 1 to 200 to 1 to 1,200 at the time when drawn. Only once during the investigation did the agglutinative value of the blood of any of the rabbits reach so high a point as that given. More often it was not higher than 1 to 600 or 1 to 800. The agglutinative value of the serum of these animals is too variable, too low, and the animals do not yield sufficient serum to be of service for work requiring so much serum. In testing these serums a laboratory culture of *B. typhosus*, which agglutinated readily, was used.

The result of the investigation is summarized in the appended chart, and serves to show the number of cases from which *B. typhosus* was isolated, as well as the appearance of cultures in litmus milk, the motility and gas production of organisms isolated from the stools and which produced blue colonies upon lactose litmus agar. The medium serves only to differentiate the colonies of *B. typhosus* from acid producers, and in that way facilitates the identification of that organism. Success with the medium in obtaining *B. typhosus* from every case depends in a great measure upon repeated examinations, and the difficulties encountered formerly in work of this character are only removed in the proportion which the

colonies of *B. typhosus* present bear to those of acid producing organisms.

The doctors in charge of typhoid fever wards of the George Washington University Hospital, Garfield Hospital, and Providence Hospital have made it possible, at a great inconvenience to themselves, for us to obtain the material which has been used. Dr. Taylor, of George Washington Hospital, has taken great interest in supplying material, without which we would have been unable to report the examination of as many specimens.

The stools contained other organisms which produced colonies somewhat similar to those of *B. typhosus* in the first 16 to 24 hours, but soon showed marked variation from them. Some cocci produce colonies which at first are blue and later become red. *B. fluorescens* colonies early assume a greenish-yellow cast. Certain organisms obtained only from the blue colonies on the Conradi-Drigalski medium produced a distinct, but not strongly, acid reaction in litmus milk.

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THE PATHOLOGY OF RABIES: THE ROLE OF MAST-CELLS IN THE AFFECTION.*

BY

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The object of the present report is to put on record an additional proof of the importance of the lesions discovered by Van Gehuchten and Nélls in the intervertebral ganglions of man and animals in hydrophobia, also to call attention to a new element in the pathogenesis of the affection. As is well known, the change is manifested by a proliferation of cells, probably from the capsules of the ganglions, which in some cases are so numerous that the space between the capsule and the nucleus of the cell is entirely filled up. This condition is usually accompanied by degeneration of the ganglionic cells themselves, inasmuch as the protoplasm with the nucleus may in some cases totally disappear and be replaced by the newly-formed small cells. These changes were found not only in the spinal but also in the pneumogastric and gasserian ganglions.

It is not necessary to enter into the historic review of the arguments which were brought forward by various writers in favor of or against these pathologic findings. Equally will I not enter into repetition of all that has been written on Babès' "rabie tubercle," which, as we know, consists of an accumulation of embryonal cells around the vessels and nerve cells of the anterior cornua of the cord and in the medulla. Both groups of writers claim their respective findings to be characteristic of rabies. Ravenel and McCarthy¹ and Walter H. Buhlig² gave us a very satisfactory review of the entire subject.

* Read before the Philadelphia Pathological Society, December 14, 1905.

Recently Négri bodies¹ became a new element in the diagnosis of rabies. The fate of these bodies is not entirely settled, as according to some they are protozoa, to others they might be degenerated red cells or else degenerated forms of nerve cells. Négri and those who succeeded in locating these bodies found them in the nerve cells of the cornu Ammonis, in Purkinje's cells of the cerebellum, in the cells of the cortex, in the pons, medulla, and spinal ganglions. Here again the specificity of Négri's bodies is questioned by some men.

The history of the case as given by Dr. Jacob, under whose care the patient was during his last illness, is as follows :

R. B. H. C., a male of 28, was bitten by a dog in the thumb of the left hand. The wound was deep ; it was not cauterized, but treated in some way was healed at the end of two weeks. Five weeks later without any apparent reason he began to complain of lassitude and had one attack of loss of consciousness lasting several minutes. The general weakness lasted about two weeks, when at the end of May he was taken with a chill. This passed away without any consequences. A day or two later he felt decidedly ill. He complained to Dr. Jacob of numbness in the left arm with pain in the back. At that time he began to show some difficulty in swallowing. The doctor soon noticed a pronounced shortness of breath with spasmodic movements of the glottis. The patient showed a great degree of excitement and more and more difficulty in swallowing. Attempts to swallow were followed by nausea. Soon the fear of water made its appearance. Attempts to raise a glass with fluid to his mouth provoked an expression of horror. Rapidly convulsions developed ; they were generalized, consisted of tonic and clonic contractions, during which the position of opisthotonos was assumed by the patient. Shortly after the convulsion the doctor found the patient with a very spasmodic respiration and complaining of a terrible sense of constriction in "the chest." A few hours before death there was a rise of temperature and delirium. Then sudden loss of consciousness with Cheyne-Stokes respiration and convulsive movements announced approaching death. During the entire course of the disease, which lasted but a few days, the patient expectorated considerably and constantly frothed at the mouth.

At autopsy the brain and spinal cord showed a moderate congestion, but otherwise nothing abnormal. The microscopic examination gave the following result :

Cervical Cord.—Among all the cells of the anterior cornua there are some that present all degrees of chromatolysis ; at the periphery of the cells can be seen groups of small round-cells. In some areas the body of the cell is totally wanting and the remaining vacuoles are surrounded with a more or less thick ring of small round-cells. Bloodvessels in the anterior cornua present a pronounced round-cell infiltration. The same is observed along the projection of the pia in the anterior fissure and around the central canal.

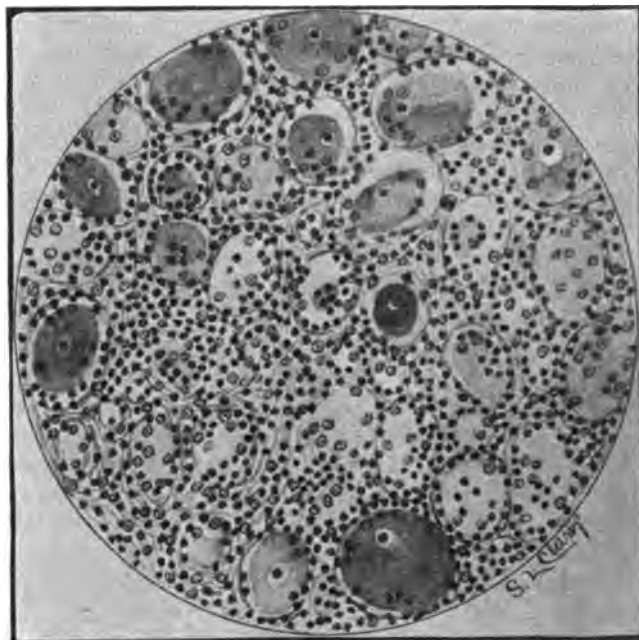
Medulla.—At the lower level of the olivary bodies some cells of the nuclei of the hypoglossi present same pericellular infiltration as the cervical cord. Some bloodvessels are also infiltrated with round-cells, but the changes are here not as marked as in the cord.

Paracentral Lobe.—A great many cells show at their periphery, especially at the pole opposite to the axis-cylinder, groups of round-cells of the same character as the cells in the cord.

Spinal Ganglions.—The majority of the cells are empty, some of them present all degrees of chromatolysis, but a great many show a marked proliferation of the cells of the endothelial capsule ; the latter in some areas fill out the cell, in some occupy a large portion at the expense of the protoplasm. In some areas where the process of destruction is intense, the periphery of the capsule itself

disappeared and the original cell of the ganglion is replaced by a new tissue composed of small cells lying close to each other. The spaces between the ganglion cells are occupied by the small round-cells, which are extremely crowded through the entire field. Through the entire field of the spinal ganglions there are seen also a considerable number of cells different from those just described ; they have all the appearances of mast-cells. These are the positive findings in the nervous system. The dorsal and lumbar segments of the cord, the occipital, frontal lobes of the cerebrum, the cerebellum and the stem of the brain were also examined, but in none of these parts were found the changes described above or any other changes. Négri's bodies were not identified through the entire nervous system.

When a comparison is drawn between the findings in this case and those of other writers one can see that while the "tubercle of Babès" which has been mentioned is present in a great many cases it has not been found in every case. In my case only a limited portion of the



Intervertebral ganglion showing cell proliferation and mast-cells.

nervous system presented these changes, namely, the paracentral lobules of the brain, the medulla in the nuclei of the hypoglossi, and the anterior cornua of the cervical cord. However, the tubercles were present there where other changes occurred, viz., in those areas in which the bloodvessels were dilated and infiltrated with round-cells. It can be concluded, therefore, that when changes in the nervous system do take place they consist in a general way of round-cell infiltration. Why only certain parts of the cerebrospinal axis were affected in the reported case and not all, as Babès claims, is difficult if not impossible to explain. The absence of pericellular infiltration in some of the cases reported since Babès' publication throws a doubt as to the pathognomonic character of this cellular alteration. As to the pathologic condition of the spinal ganglions, the changes have been found in every case since Van Gehuchten and Nélis called attention to it. In the present case they are very pronounced. The majority of the cells showed

almost complete disappearance of the protoplasm and proliferation of the endothelial cells of the capsule in such an abundance that in some areas are seen round masses absolutely filled with cells.

In view of the fact that Babès' findings are not constant and not always found in all the portions of the nervous system as described by Babès, while the findings in the intervertebral ganglions as described by Van Gehuchten and Nélis are invariably present in every case, it may be presumed that the latter is the specific lesion of rabies.

One fact must be mentioned in connection with the pathologic specificity of rabies. Some authors reported cases with similar changes in the intervertebral ganglions and in the cells of the cord or medulla in other affections: as, for example, local irritations (endothelioma by Spiller, Dercum, and Keen), or general intoxications (Crocq), also one case of Landry's paralysis (by Sherman and Spiller). However, we must say that these cases are very few in the literature; on the other hand, *all* the cases of hydrophobia showed persistently changes in the intervertebral ganglions. The present case is an additional proof of this assertion, which in my opinion is of extreme practical importance. For the purposes of rapid diagnosis especially, Van Gehuchten-Nélis' findings are the most trustworthy means. In conclusion, I will call attention to a new element detected in the cells and between the cells of the intervertebral ganglions. I wish to speak of the *mast-cells*. The presence of these cells in nervous tissue of cases of rabies was described for the first time, and if I am correct, only by Carlos França in the *Névrose*, 1901, p. 331. This author found these cells in abundance in 100 cases of dogs affected with rabies, also in experimental rabies. His studies led him to conclude that there is undoubtedly a certain relationship between the characteristic lesion of the spinal ganglions and the mastzellen. The latter are perhaps also pathognomonic of rabies.

Authors who made special investigations of mast-cells maintain that irrespective of their origin they were found in abundance in connective tissues of the body and are increased in number when these tissues are subjected to long-continued irritations. Ehrlich says that mast-cells are produced in large quantities locally wherever an overnutrition of connective tissue occurs. H. F. Harris⁴ found them in violent inflammatory conditions. In rabies the condition of spinal ganglions appears to be inflammatory. The presence of a large number of mast-cells in the ganglions in my case finds its *raison d'être*. The reported case is therefore interesting and important from this standpoint, that it not only corroborates the Van Gehuchten-Nélis discovery, but also shows the presence of a special class of cells (mast-cells of Ehrlich), thus confirming França's observations. The latter circumstance, being very significant from a diagnostic standpoint, is perhaps an indication of the localization of the specific virus in the spinal ganglions. Harris⁵ observed that in the vicinity of the mast-cells which occur in the buboes of bubonic plague the bacilli are often absent; he therefore concludes that the cells may elaborate some bactericidal substance. My case and those of França present abundant mast-cells only in the

intervertebral ganglions, in which the lesions are more pronounced than in any other portion of the nervous system. I am therefore justified in considering the ganglions as the only organ for which the rabic virus has a special predilection.

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- ⁵ *Loc. cit.*

THE TRAINING OF NURSES.¹

BY

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It is neither my place nor is it necessary for me to bestow laudation upon the nobility and the sacrifices of a nurse's calling. As in the case of my own profession, such sacrifices are not only a duty, but they should be cherished as a pleasure. I would rather ask permission to criticize the shortcomings in the training of nurses as they have been forced upon my observations during a professional life of nearly twenty years.

To take up the general requirements first of all. Women should be chosen with regard to their personal qualifications, mental as well as physical. They should have a love for work, sacrifice, and humanity, with all that these qualities imply. The probation period should be long enough to allow the unfit to be weeded out, and this latter process should be severe, judicial, and searching.

Youth, attractive personality, and the activity of young womanhood count for much in the fight for professional existence. The wage-earning life of a nurse is about ten years. This should influence the schools against selecting too youthful candidates before the age of discretion, judgment, and the appreciation of the seriousness and responsibility of their calling is formed.

The strictly professional training given in our large schools is sufficient. In many respects it is more than sufficient. Except in a small special class that I will consider later, nurses should be taught much less anatomy, physiology, pathology, bacteriology, and chemistry. The imperfect knowledge that nurses can acquire in such branches is dangerous, misleading, and conducive to a false estimate of their own importance.

It would be far better if more time were devoted, both didactically and clinically, to teaching nurses to be genuinely humane. This quality I believe is the one most lacking in the average nurse. In fact, genuine humanity is less deeply ingrained in women than in men when dealing with the sick. They should be taught to differentiate between sympathy and sloppy sentimentality.

They should be taught personal cleanliness. Most nurses are clean by nature. Some think that they can substitute perfumery and overstarched linen for bodily cleanliness. Such substitution is most annoying to a sensitive patient. The nurse's laundry is a serious obstacle

¹ Read at the third semiannual meeting of the New England Association for the Education of Nurses.

in any household. Economy in this regard will meet all requirements as to personal neatness and will appeal to the average family much more than wasteful and needless costuming.

More time should be devoted to teaching nurses household work, cooking, ordering of supplies, cleaning of rooms, etc. Of the many nurses employed in my own family I can recall only one who knew how properly to clean the sick room and bathroom under her care. They should know how to respect the patient's property. Illness, however slight, incommodes a family. A nurse adds much to the inconvenience. If she maltreats the floors, the rugs, the bathroom, etc., so that there are large bills for repairs after the termination of her duties, she brings needless burdens upon a family already oppressed.

The nurse should be taught that the family routine and habits are not formed on the basis of the training school and that they should not be disturbed, except for necessity. Occupancy of the best rooms, use of the dressing rooms, ill-timed appropriation of the kitchen range often disturb the comfort and needs of a family already upset by worry and anxiety. Relaxation and out-door recreation are necessary for the nurse's health. The same is true of the anxious wife or mother, but the nurse with tact and a feeling for humanity will insist upon her hour's relaxation in conformity with the ways and customs of her family.

A nurse is paid for work. Time spent in useless knitting or fancy work at the cost of a dirty sick room or of a bathroom kept in topsy-turvy condition, is begrudged by the patient, especially if she herself is a conscientious housekeeper.

No nurse is so well trained that she cannot learn from an intelligent patient or from a strange physician, and it is not at all rare to find a nurse far inferior in womanly ways to a trusted household servant. Such a nurse is inclined to enter upon her duties with an announcement of her own superiority and fitness. This creates prejudice and ill-feeling for which the patient pays the penalty.

Servants do not like to wait upon nurses, especially under compulsion. The nurse must realize that any honorable labor is within her duties. These duties cannot always be drawn on hard and fast lines.

All patients do not demand nor require a similar amount of fussy detail in nursing. This should be recognized and nurses should learn to adapt themselves to the type of patient.

How best can these petty details be learned by the pupil nurse? By training which requires more or less work under supervision in dispensary and private families during her pupilage. No institutional nurse is fit to undertake first class private nursing without some early training of this character. Our large hospitals should be required to treat private patients if for no other reason.

Female nurses should be taught to administer to the necessary wants of male patients. Silly questions of false modesty should be buried by the seriousness of their professional calling.

In their hospital training they should be taught, next

to the qualities of humanity and tact, to study their patients clinically, to observe the mental and physical changes, the actions of medicines or treatments of any kind, the benefit from foods, the changes in pulse and respiration, etc., all the little details that do not demand skilled knowledge in the abstract medical sciences, but do demand observation, common sense, tact, and honesty.

All the requirements necessary for the cure of a large majority of patients can be learned in a short course. Most women are suited for this amount of training and no more. The exceptional women should be allowed to take graduate or advanced courses in which the specialties are taught. Thus we should have selected skilled nurses for major surgical nursing, for obstetrics, for contagious diseases, etc. These women should command higher wages than the routine nurse. This condition holds in all professions, and there is no reason why this one should be exempt.

In conclusion, the nurse should be trained to cultivate tact, humanity, and the gentle art of caring for the sick. She should be less elaborately trained in the science of medicine. A few selected women should be trained for special and advanced work, but the selection should be exercised with great care and judgment.

THE "KING'S EVIL" AND ITS "CURES."

BY

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M.R.C.P.I.; M.R.I.A., Etc.

of Dublin, Ireland.

[Concluded from page 453.]

The writer of the article then proceeds to discuss the processes of incision, extirpation, subsequent dressings, &c., and towards the end of a long dissertation on the various special forms of strumous disease, he returns to the neck and indicates a confusion of ideas between scrofula and goiter, which does not seem to have prevailed so much in even less enlightened times.

"Those Tumours are called strumous, or scrophulous, which appear externally, on the anterior and lateral Parts of the Neck. Of these Tumours there are different Species; some are small, some of a moderate Size, and some surprisingly large; some are soft, others hard; some are moveable, others immovable; some are favorable, others malignant. Scrophulous Tumours arise in indurated Glands of the Neck; sometimes in the small moveable Glands; sometimes in the superior and inferior salival Glands, and sometimes in the Thyroide Glands, which last are by some particularly called *Scrophulæ*, or the King's-Evil; and by the French, *Ecouelles*."

The views of the commentators and editors of the famous "Regimen" drawn up by the medical faculty of Salerno for the profitable physical instruction of Robert of Normandy, throw a good many sidelights on the pathologic views held during the Dark Ages on scrophulous and allied disorders. I proceed to quote as a specimen the lines which especially allude to strumous disease from an edition which bears the following title:

"Schola Salernitana, sive De conservanda Valetudini Præcepta Metrica. Autore Joanne de Mediolano hactenus ignoto. Cum luculenta and succinta Arnoldi Villanovani in Singula Capita Exegesi. Ex Recensione Zachariæ Sylvii Medici Rotterdamiensis. Cum ejusdem Præfatione."

The first line indeed, completes the notice of scrofulous disease; the second carries on the pharmacology.

"Scrofa, tumor, glandes, ficus cataplasmate cedunt. Iunge papaver ei, contrafacta foris tenet ossa."

These lines have been thus Anglicized—

"A plaister made of Figges by some men's telling
Is good against all Kernels, boyles and swelling.
* * * * *

With Poppy joyn'd, it draws out bones are broken"
—in an anonymous English version published in London (1607), with the title: "The Englishman's Doctor, or The School of Salerne. Or Physicall Observations for the perfect Preserving of the Body of Man in continuall Health."

The fact that over 160 editions of this remarkable production appeared in the centuries preceding the modern literary deluge is proof positive of the immense influence which its verses must have exercised. They were addressed to Robert, Duke of Normandy, eldest son of William the Conqueror, and prepared by the Medical Faculty of the University of Salerno, the "Mater et Caput" of all the Universities and Medical Schools of Christendom.

The universal celebrity of the "Regimen" of the famous School of Salerno caused its translation into English in the still embryonic state of that language. The resulting rare and curious black-letter gem bears the following title:

"Regimen Sanitatis Salerni. This booke teachyng all people to gouverne them in health is translated out of the Latine tongue into Englishe, by Thomas Paynell, which booke is amended, augmented, and diligently imprinted, 1575. Imprynted at Leondon, by Wylliam How, for Abraham Weale."

And the orthography, etymology and syntaxes of pre-Shakespearian English are all thoroughly illustrated in the commentary on the first line of the above quotation, which I here reproduce:

"Here the auctour saith, that plaisters made of figges are holsome againste thre diseases, yt is to saie swines yuell, Kirnels and swellinges. By swynes euil is understand inflation under the chynne about ye throte. And it is called scrofula a scrofa, that is to say, a sowe or a swyne, either because this disease chaunceth manie tymes too swyne through their gulositie; or els because ye shappe of this disease is lykened to a swyne, as Avicen sayth. By Kyrnels are understand impostumes, whiche commonly chance under ye arme pittes and in the groynes. And by swelling may be understande inflasions in any parte of the body. Wherefore to hele these impostumes, & specially to rype them, fygges should be sodde in water, and wt the water shuld be mixed a little curtsy of vineger, ye whiche helpeth ye vertue of figges to entre. And whan it is sodde, the fygges must be beaten in a morter: and then myngled with a courtysy of water that they were

sod in, & so make a playster. A playster is proprely medicine made of some herbe or flower, and the juyce thereof....."

Another more rare, more copious, and, in many ways, quite as interesting a black-letter volume devoted to "matters medical" had appeared even before (1558) that from which the last quotation has been made. It consists of four parts, of which the first has the following title:—"The Secrets of maister Alexis of Piemont, by him collected out of diuers excellent authors, and newly translated out of French into English, with a generall Table of all the matters conteyned in the sayde Booke. By William Warde." A good many of the "secrets" are found to consist of various modes of "cure" for the King's Evil, showing very forcibly how much the treatment of this peculiarly untractable form of disease had puzzled the wits and overtaxed the scientific attainments of both amateur and professional healers down through all the centuries.

The first "secret" which I have selected from this volume happens to be one which I have not found in print elsewhere; and its existence in the collection of "maister Alexis" is a curious illustration of the widespread diffusion of similar popular ideas among the uninitiated of all the countries and all the ages. The item in question is a method of making an absolutely accurate differential diagnosis—a most important contribution to the knowledge of the period, when the diagnosis was generally as hazy as the treatment was doubtful.

"HOWE TO KNOWE THE KING'S EUILL.

"Take a grounde worme alyue, and laye hym upon the swelling or sore, cover him with a leafe; if it be the King's euill, the Worme wyll chaunge and tourne into earth, if it be not, he wyll remayne whole and sounde.

In my boyish days in the West of Ireland I heard this method of diagnosis enunciated by an agricultural laborer, who was a relative (and "near neighbor") of a person who practised a "cure." The only difference is that the Hibernian worm merely died at once; there was nothing said of hasty decomposition.

I now proceed to give a series of remedies culled from the pages of this very rare and very interesting volume of *Secrets*:

"A verie good easie remedie against the disease called the Kinges euill.

"Take the herbe called Farfara, Foale foote in Englishe, well stamped with his rootes, and then beeyng mingled with the flowre of the seede of Line or Flaxe, and the grease of a Barow, make thereof a plaster, and laie it upon the sore changing it twice a daie, and all the sores of the disease shall be resolved into sweate. After thei be healed, washe often the place with white Wine, by the space of ten or fiftene daies.

"An other remedie against the same disease.

"Take the stones of an Horse, and put them in a Firepan among the embers and coles, leauyng them there, untill thei maie be beaten into powder, then giue the Patient drink of the saied powder in White Wine, the quantitie of twoo penie weight, continuyng this the space

of XXI daies, by this means you shall make hym caste out his mouthe, all the ordure, and filth of the euill, and shall heale hym thoroughly.

"A verie good remedie against the Kinges euill—

"Take Ceruse or white Leade well stamped, fower unces, oile Oliue eight unces, let this boill together five or sixe howers, styrring it continually, and when it is waxen, or become verie blacke, it is sodden enough: then spreade it uppon a linnen clothe, and laie it unto the place of the sore: if the sores bee broken, thei will bee healed incontinate: if not, they will resolue and loose, and shortly heale thoroughly.

"To heale the same disease, by a substance taken at the mouthe.

"Dresse a Henne as it were to eate, so that she bee boiled in a great Potte, or Caudron, with a greate deale of water without Salte, lettynge it boile untill all the bones bee separated from the fleshe, then take the saied bones, and drie in an Ouen, or at the fire, so that thei bee not burned, or waxed blacke; after this, beate them well to powder, and take of the seede of *Sesamum*, beaten well likewise into powder, and mingle it with the powder of the Hennes bones, as much of the one as of the other. And so take a spoonefull of the twoo pouders, and mingle it with Honie, causyng the Paciente to eate of it at Night, when he goeth to bedde, and in the Mornynge when he riseth. This ought to bee dooen from the beginnyng of the quarter decreasyng of the Moone, unto the ende: It is a verie excellent Secrete. It also happened to me of some menne, in whom the saied disease was so olde, and farre gone, that the saied remeadie could not help them. Whom I caused to take with the saied powder specified, as followe, whiche oughte to bee made after this maner. Take a certaine little Serpente called a Slowe worme, boile hym in oile Oliue, untill he be broken and consumed, then rubbe the euill with the saied oile, and laie pieces of Towe upon it, leauyng it so three or fower daies: and after that, make a newe annointyng, and laie Towe to it againe, as before. By this saied remeadie I healed them perfectly, thankes be unto God.

"TO HEALE THE KINGES EUILL, A DISEASE CALLED IN LATINE SERUMA.

"Take a great Tode aliue, and when the Moone draweth towarde the coniunction of the sunne, cut of the legges from him, and put him about the necke of the patient, and it will doe him muche good. Take also the hoofe of an Asse and burn it, and lay it upon the sore, for it is very good and profitable for such sicknesse.

"TO HEALE THE DISEASE CALLED THE KING'S EUILL.

"Take Barley floure, Liquide Pitch, Waxe, and oyle of equall quantitie, mixe all together, and seeth it well, and put into it a little pisse of a young childe, and stirring it well about, laye it upon the sore in maner and forme of a plaster, and it wyl heale it.

"TO REMEDIE THE KINGES EUILL.

"Wash the sore and wartes with the decoction of the rinds of Caphers: then take a Serpent, and having cut away his head and tayle, put the other part into an earthen pot that hath holes in the bottome, and beyng well luted both aboue and beneath, put unto it another pot as a receiver, whiche you shall cause to stande upon a pot filled with water, which shall boyle so long untill

the Serpent bee dissolued into oyle, unto the whiche adding the powder of the rootes of Capers, annoynt the grieve eight daies therewith and it shall be healed.

"AGAINST THE KING'S EUILL IN CHILDREN.

"Take of the iuice of Sothern wood, and of marsh Mallowes, and of the Mutillage of the kernels of unripe grapes, of ech like quantitie; lay them beyng all mixed together upon the sore. But if it be hard, dissolue in the said iuices of Gum Armoniack or of Bdelium, and use it as a plaister uppon the euill, and you shall see a happie successe.

"AGAINST THE KING'S EUILL.

"Take of Liquide Pitche, of waxe, of urine of children, and of meale of Barly, of eche as much as you please; mixe them together, and putting thereunto a little oyle Oliue, laye thereof many tymes upon the grieve.

"TO REMEDIE THE KING'S EUILL.

"Take Vitriol and put it upon the coles, and let it boyle and cast spume so long, that it become red: then braie it, and put it to dissolue in Aqua vitæ, and beyng taken out, let it drie, and thus doe three tymes: then put it into a fine peece of linnen cloth and let it hang in a moist place, with a potinger or some other recipient under it, for it will cast oile like unto oile of Tartar. Take as much of the saied oile, as of Aqua vitæ, and bathyng therein a sponge, bind it upon the sore, and in short space it will breake it.

"TO HEALE THE KING'S EUILL AND OTHER HARDE IMPOSTUMES.

"Take of Mustarde Seede, of Nettle Seede, of Sulphar, of the spume or fume of the Sea, of Aristologia, of Bdelium, of Ammoniack, and of olde oyle, of eche like quantitie, braye all things that are to be brayed, and dissolue the Gummes in vinegar and make a plaister.

"TO DISSOLUE THE KING'S EUILL, AND EVERY HARD IMPOSTUMATION.

"Take of Salt Peter one pounce, of Litarge of Siluer, as muche more, of the filthe of oyle vesselles foure pounce, of Galbanum foure pounce and a halfe, braye the Salt, and the Litarge, and putting thereto the filthe, bray it againe, and set it to boyle in an earthen vessel, laboring it often with a spatter, and when it doth not cleave to the fingers, take it from the fyre, and bray the Galbanum with a Pestell of wood, and meddle and dissolue them together, and being wrought upon Marble, keepe it to use when neede shall require, it will be verie marueilous."

So much for "maister Alexis of Piemont."

It is well known to all those who are acquainted with the conditions of life in the Middle Ages, that a large portion of the practice of the healing art was then exercised by the members of the ecclesiastical orders. In the years of monastic retirement which long preceded his elevation to the See of St. Peter, Petrus Hispanus benevolently occupied his leisure hours in the compilation of his "*Thesaurus Pauperum*," a "Poor Man's Treasury" of the most celebrated known remedies, an English version of which appeared (without date) about 1550. A comparison of the remedies collected by "mais-

ter Alexis of Piemont," and by Petrus Hispanus, with those mentioned by Bonet, and the writer of the article in James's Dictionary, cannot fail to impress the careful observer with the hopeless thralldom to which the human intellect was subjected in presence of the incudous of "Authority" down to comparatively recent times. The authorities of Hippocrates and Galen, of Aristotle and Pliny, possessed nearly the same power to charm in the middle of the last century that they had possessed 1,500 years before.

The same helpless and hopeless groping in the dark, for relief still unattainable, is illustrated in the writings of all those who have dealt with this scourge of humanity down almost to our own times. We have seen how large a part of existing medical practice the Church appropriated in the Middle Ages, and we know that as knowledge became more widespread its more enlightened votaries did not neglect to educate themselves in the healing art. Francis Bacon tells us that he had been "puddering in physick" all his life. His successor on the throne of English philosophy, Robert Boyle, compiled a "Collection of Choice and Safe Remedies," many of which were intended for the King's Evil.

In common with so many of the learned men of what may, I think, be fairly called the pre-scientific centuries, the courtly and accomplished warrior and adventurer, Sir Walter Raleigh, devoted many of his leisure hours to cultivation of the theory and practice of the healing art. His "Cordial" long possessed a very high reputation in the healing of scrofulous and other inveterate diseases which had resisted the orthodox means employed by the licensed members of the faculty. In the very interesting little volume, "The Court and Character of King James, written and taken by Sir A. W., being an eye and eare witnesse," we are told that

"Queen Anne, that brave Princesse, was in a desperate, and beleaved, incurable Disease, whereof the Physicians were at the furthest end of their studies to find the cause, at a Non plus for the Cure, Sir Walter Rawleigh being by his long studies an admirable Chymist, undertooke, and performed the Cure, for which he would receive no other reward, but that her Majesty would procure that certaine Lords might bee sent too examine Cobham, whether he had accused Sir Walter Rawleigh of Treason at any time under his hand; the King at the Queen's request (and in Justice could doe no lesse) sends six Lords... to demand of Cobham, whether he had not under his hand accused Sir Walter Rawleigh at Winchester, upon that Treason hee was Arraigned for; Cobham did protest never, nor could he; but said he, that Villaine Wade did often sollicite me, and not prevailing, got me by a trick to write my name upon a piece of white Paper; which I thinking nothing did, so that if any charge came under my hand, it was forged by that Villaine Wade, by writing something above my hand without any consent or knowledge. These six returning to the King, made Salisbury their Spokes-man who said: Sir, my Lord Cobham hath made good all that ever he wrote, or said, and this was an equivocating trick, for it was true, he made good what-

ever he writ, but never wrote anything to accuse Rawleigh; by which you see the basenesse of these Lords, the credulity of the King, and the ruine of Sir Walter Rawleigh. I appeal now to the judgement of all the world, whether these six Lords were not the immediate Murtherers of Sir W. Rawleigh and no question, shal be called to a sad account for it."

If it be true, as Court gossip stated, that the malignant revenge of Salisbury was dictated by a "kind of wild justice" for the too serious practical joke which Raleigh had played upon him in former years, and which in the end cost each his life, we have in this case one of the most striking examples that history affords of the inextricable connection between private passions and public life, between individual morality and historic pathology. Of the nature of the disease of which Salisbury was the victim, his numerous enemies at least professed to have no doubt, as some of the epitaphs with which they pursued their vengeance after his death clearly show. The following has been preserved by Osborne:

"Here lies thrown, for the worms to eat,
Little Bossive Robin, that was so great,
Not Robin Goodfellow, nor Robin-Hood,
But Robin the Encloser of Hatfield Wood;
Who seem'd as sent from ugly Fate,
To spoil the Prince and rob the State,
Owning a mind of dismal ends,
As Traps for Foes, and Tricks for Friends,
But now in Hatfield lies the Fox
Who stank while he liv'd, and died of the —."

Others among his detractors announced that he died of the "Herodian disease," while his apologists aver that he perished as a victim "of a complication of disorders operating on a scorbutic habit of body."

The constituents of "Rawley's cordial" have been preserved for us in a remarkable eulogistic commentary, written by a French scientist of the period. For the benefit of the curious it is here reproduced:

"RECIPE Rasuræ Corni Cervi Libram unam: Carnis viperarum cum Cordibus & Hepatibus uncias sex; Florum Boraginis, Buglossæ, Roris Marini, Calendulæ, Vetonicæ Coronariæ rubræ, Roris Solis, Rosarum Rubrarum, & Sambuci, singulorum libram semissen; Herbarum Scordii, Cardui benedicti, Melissæ, Dictamni Cretici, Menthæ, Majoranæ, Betonicæ, singularum manipulus duodecim; Granorum Kermes recenter in rob redactorum, Cubebarum, Cardamomi majoris, Baccarum Juniperi, Maceris, Nucis myristicæ, Caryophyllorum, Croci, singulorum uncias duas; Cinnamomi acutissimi, corticis ligni Sassafras, flavedinis malorum Citriorum & Aurantiorum, singulorum uncias tres; Lignorum Alôes & Sassafras uniuscujusque uncias sæx; Radicum Angelicæ, Valerianæ, Carlinæ, Fraxinellæ seu Dictamni albi, Serpantaræ Virginianæ, Zedoariæ, Tormentillæ, Bistortæ, Aristolochiæ longæ, rotundæ & cavæ, Gentianæ & Imperatoriæ, Singularum unciam unam & semissem. Omnia incisa & grossa modo confusa in vase idoneis posita cum Spiritu Vini rectificato extrahantur secundum Artem. Tincturæ filtratæ in extractum mediante, in Mariæ balnes, distillatione evaporentur. Magma expres-

sum comburatur; Cineres reverberati per aquam elixivientur, unde Sal purum lege Artis paretur, quod Extracto misceatur. His ita peractis, huic Extracto adde, ut Artis est, Pulvereni sequentem ceteraque ingredientia. *Recipe* Lapidum Bezoardicorum orientalium & occidentaliū verorum uniuscujusque unciam sēmissē, Magisterii solubilis Carollorum rubrorum uncias tres; Boli orientalis, Terræ Sigillatæ veræ, Unicornu mineralis, Cornu Cervi Philosophicè præparati, & Cornu Cervi calcinati, singulorum unciam unam; Ambra griseæ electissimæ in Essentiam redactæ unciam unam; Moschi orientalis optimi essentificati drachmam unam & semissem; Croci Solis cum tinctura Antimonii *Basilii Valentini* parati drachmas duas; Sacchori candisati albi subtilissimè pulverisati libras duas. Ex his omnibus mixtis & ex Arte unitis fiat Confectio vevè Regia, quæ ad usum reservetur in pyxidibus apprimè clausis."

Whatever opinion we may form in the present day of the therapeutic value of this elaborate formula, it can hardly be denied that there is something to admire in the studious attention which the gay and gallant Sir Walter must have bestowed upon its preparation.

The famous "Brevarie of Health" of Andrew Boorde—the "Merry Andrew of Physicians," Andreas Perforatus of his own periods of comic dignity—contains but one short chapter on the subject, and his method of dealing with the condition reminds me forcibly of the time-serving policy of John of Gaddesden, to be afterwards referred to.

"The 236 Chapter doth show of the King's euill.—"*Morbus regius* be ye *Latin* words. In English it is named the King's euill, which is a euill sicknesse or impediment.

"THE CAUSE OF THIS IMPEDIMENT.

"This impediment doth come of the corruption of humours, reflecting more to a perticular place than to vniuersall places, & it is much like to a fidle, for and if it bee made whole in one place it will breake out in an other place.

"A REMEDY.

"For this matter let euery man make friends to the King's maiestie, for it doth pertain to aking to help this infirmitie, by the grace ye which is giuen to a king anyoynted. But for as much as some men doth iudge diuers tymes a fistle or a *French* pocke to bee the king's euill, in such matters it beehoueth not a king to meddle withall, except it be thorow & of his bountifull goodnesse to giue his pitifull and gracious counsell. For kings and kings' sonnes and other noble men hath beene eximious *Phisicians*, as it appeereth more largely in the *Introduction of Knowledge*, a book of my making."

As our author enjoyed what some of us would probably consider the uneasy dignity of physiciancy to his Majesty King Henry VIII, we can appreciate the discretion which dictated the remedial diplomacy recommended in this chapter. It may not be uninteresting to mention in this connection that the "Brevarie" from which the above quotation has been taken is said to be the first manual of medical theory and practice composed in English by one of the Faculty.

This chapter of the witty Andrew Boorde furnishes a convenient turning-point from which I may proceed to make a new digression, for the purpose of taking notice of the curious and interesting practices of curing the King's Evil by Royal Touch.

Some sympathetic poet, whose name I have not preserved, penned the following lines, and also appears to have added the subjoined comment which I find in my common-place book:

"THE TOUCHING FOR THE EVIL.

You have spoken light word of the touching of old,
But you never have heard of the good Angel-gold.
For it was not alone the Monarch's kind eye
Nor the links that are gone 'tween the low and the high.
No, not for these only, though these they were much,
Came the stricken and lowly, to kneel to the touch.
The soft hand was put out, and the soft solace said,—
Few mourners could doubt that their evil had fled.
For, evil it ceases, and sickness it goes,
With bread golden pieces, and Nobles of rose.
Then when in their rest, in the stillness of night,
With their troubles redrest, and their burdens made light,
Oh, blame not their blindness, 'twas the blindness of love,
Made them think that this kindness it came from above.
And when 'twas thus given to those who had need,
That same thing of Heaven was Majesty's meed.
Then list to my warning, and cavil no more,
With light words and scorning, at the good forms of yore.

"In the reign of the 'merry monarch' the angel-gold, which was distributed by his Majesty's almoners to those who came to be touched, amounted to £5,000 per annum.

"When the entire public revenue was under a million and a half pounds sterling. It must be allowed that this was a large sum to be distributed in one form of charity; and the historic fact may be held to prove that the second Charles Stuart possessed some better qualities than his Puritanical detractors would have us to believe. We may note that the sum so graciously expended amounted to £1,000 a year more than the combined salaries of the Secretaries of State, and was also £1,000 a year more than the allowance to Prince Rupert. But it is not so much its amount which almost makes a regret for this graceful superstition, as the direct communication it brought about, between the highest and the lowest, between the King and the Poor. If Royalty did but condescend to lower itself to a familiarity with the people, it is curious that they will raise, exalt, adore it, sometimes even invest it with divine and mysterious attributes; if, on the contrary, it shuts itself up in an august and solemn seclusion, it will be mocked and caricatured. This was one of the secrets of Napoleon's strength, and one of the secrets of Louis XVIIIth's weakness. If the great only knew what stress the poor lay by the few forms which remain to join them, they would make many sacrifices for their strength and preservation. Dr. Johnson—a man of the people, if there ever was one—was yet prouder of having been touched by Queen Anne, when he was a child, and of speaking about 'the great lady in black,' of whom he had

an indistinct recollection, than he was of all his heroism under misfortune, or of all the erudition of his works."

The famous and loyal antiquarian scholar, Thomas Hearne, appears, from the evidence afforded by an entrance in his *Diary*, to have been as orthodox in his faith regarding the efficacy of the Royal touch for the King's Evil as he was in the other articles connected with "privilege" and "legitimacy."

"Yesterday, Mr. Gilman of St. Peter's Parish in the East, Oxford (a lusty heartick, thick, short man), told me that he is in the 85th year of his age and that at the restoration of K. Charles II being much afflicted with the King's Evil, he rode up to London behind his father, was touched on a Wednesday morning by that King, was in very good condition by that night, and by the Sunday night immediately following was perfectly recovered, and hath so continued ever since. He hath constantly worn the piece of gold about his neck that he received of the King, and he had it on yesterday when I met him."

It is interesting to note here that the custom of treating the King's Evil by the royal touch is mentioned by the earliest English writer on medicine, whose works have descended to us. Gilbertus Anglicus is made by Bale a contemporary of King John, while Freind argues from the interval evidence supplied by his own writings, that he was more probably coeval with King Edward the First. I quote from the English version of Freind's "Historia Medicinæ:"

"In treating of a *strumous* swelling in the glands, he tells us that this disorder is otherwise called the *King's Evil*, because Kings cure it. This account, however concise, from a Physician who seems not to have been led by any bias of interest, is sufficient to convince us that the custom of *Touching* was very early introduced by our Kings; and from this author's manner of expressing himself, it is very plain, that he look'd upon it as a very ancient Practice. The *French* historians can trace up this usage of *Touching* in their own nation, by undoubted authorities, as high as the *eleventh century*, in the reign of *Philip the First*, but can give no account (which can be rely'd upon) how much more ancient it was: tho' some pretend to trace it as high as *Clouis*. There is the like reason to think, even by this passage as well as by what is here and there hinted in our *English* history, that the same usage had, for some *Centuries* at least, prevail'd here; and they who carry it up as far as the time of *Edward the Confessor*, contemporary with *Philip the First* of *France*, seem to have good grounds for their opinion; at least I do not see any proofs, which can be brought against it. If the *Monkish* writers are supposed to be at all partial, and inclin'd to flatter the Crown, there are others, whose veracity cannot be call'd in question. Sir *John Fortescue*, a very learned and wise man, in his defence of the title of *Lancaster*, just after *Henry the Fourth's* accession to the Crown, represents the gift of healing, as a privilege, which had from time immemorial belong'd to the Kings of *England*: and he is so particular as to attribute this to the *Uction* of their hands, which is us'd at the Coronation: and therefore says, that *Queens* can have no such gift, because in this case that part of the ceremony is left out. However, we

know Queen *Elizabeth* thought herself so much a King, that among other regal Functions she frequently exercised this. Archbishop *Bradwardine*, who dy'd in 1348, and who appeals to the World for the cures perform'd by the royal *Touch*, uses, you will see, very strong expressions concerning the antiquity of it: which surely he wou'd never have done, had it been so modern a practice, as some think it."

The following is the passage in Sir John Fortescue's "Defence of the House of Lancaster," to which Freind refers, and which he had found preserved in the Cotton Library. It will, I feel sure, interest all students of the history of our profession:

"Item Regibus *Angliæ* Regali ipso officio plura incumbant, quæ naturæ muliebri adversantur—Regis *Angliæ* in ipsa unctione sua talem cælitus gratiam infusam recipient, quod per tactum manuum suarum unctarum infectos morbo quodam, qui vulgo *Regius morbus* appellatur, mundant & curant, qui alias dicuntur incurabiles. Item aurum & argentum sacris unctis manibus Regum *Angliæ* in die Paschæ Divinorum tempore (quemadmodum Regis *Angliæ* annuatim facere solet) tactum devote & oblatum, spasmodicos & caducos curant; quemadmodum per annulos ex dicto auro seu argento factos, & digitis hujusmodi morbidorum impositos, multis in mundi partibus crebro usu expertum est. Quæ gratia Reginis non confertur, cum ipsæ in manibus non ungantur."

The following extract from Archbishop Bradwardine's *Libet de causa Dei* contains the passage alluded to by our medical historian:

"Quicumque negas miracula Christiane, veni & vide ad oculum, adhuc istis temporibus in locis sanctorum per vices miracula gloriosa. Veni in *Angliam* ad Regem *Anglicum* præsentem, duc tecum Christianum quemcunque habentem morbum Regium, quantumcunque inveteratum, profundatum, et turpem, & oratione fusa, manu imposita, ac benedictione, sub signo crucis data, ipsum curabit in nomine *Jesu Christi*. Hoc enim facit continue, & fecit sæpissime viris & mulieribus immundissimis, & catervatim ad eum ruentibus, in *Anglia*, in *Alemania*, & in *Francia* circumquaque; sicut facta quotidianæ, sicut qui curati sunt, sicut qui interpuerunt & viderunt, sicut populi Nationum, & fama quam celebris certissime contestantur. Quod & omnes Reges Christiani *Anglorum* solent divinitus facere, & *Francorum*, sicut libri antiquitatum & fama vegenorum concors testantur: unde & *morbus Regius* nomen sumpsit."

The first medical author who appears to have formally recommended sufferers from the King's Evil to have recourse to the Royal Touch when all the resources of his own profession had failed, was the diplomatic John of Gaddesden, whose famous *Rosa Anglica* still, fortunately, survives for the edification of professional posterity. This interesting treatise is colored by the mysticism, and quaint—very often, indeed, loathsome—therapeutics of the "dark" age in which it was produced. (The volume appeared somewhere between the years 1305 and 1315.) It is also distinctly redolent of professional avarice and unprincipled charlatanism. The wily John had "boo'd" himself into the position of Physician-in-Ordinary to the

King, and his successful treatment of the heir-apparent to the Crown, while suffering from smallpox—by swathing him in scarlet, and draping his room so completely with materials of the same tint, that only rays of that color could penetrate to the patient—has contributed a well-known item to professional history. In the language of Freind:

"John was no sooner at Court but he understood how to make a good Courtier, and pay his compliments in the best manner; and whenever a scrophulous case does not submit to the sovereign remedies, such as the blood of a weazel or Doves-dung, he exhorts the person immediately to apply to the King for the royal Touch."

In the original text of the *Rosa Anglica*:

"Siista non sufficient, vadat ad Regem, ut ab eotangatur et benedicatur—Valet tactus nobilissimi & serenissimi regis Anglicorum."

One of the phenomenal healers of the annals of unlicensed medicine was my fellow-countryman, Valentine Greatrakes, who, in Charles the Second's reign, performed "severall marvailous cures by the stroaking of his hands." This practitioner's treatment would appear to have combined the properties and powers of the "Mesmerism" and the "Massage" of the present century.

"He was born on the 14th of February, 1628, on his father's estate of Affane, in the County of Waterford, and was on both sides, of more than merely respectable extraction, his father being a gentleman of good repute and property, and his mother being a daughter of Sir Edward Harris, Knt., a Justice of the King's Bench in Ireland. The first years of his school life were spent in the once famous Academy of Lismore; but when he had arrived at thirteen years of age his mother, who had become a widow), on the outbreak of the rebellion fled with him and his little brothers and sisters to England, where the fugitive family were hospitably entertained by Mr. Edmund Harris, a gentleman of considerable property, and one of the justice's sons. After concluding his education in the family of one John Daniel Getseus, a High-German minister of Stock Gabriel, in the County of Devon, Valentine returned to Ireland, then distracted with tumult and armed rebellion; and by prudently joining the victorious side, reentered upon the possession of his father's estate of Affane. He served for six years in Cromwell's forces (1650-1656) as a lieutenant of the Munster Cavalry, under the command of the Earl of Orvery....

"When the Munster Horse was disbanded in 1656, Valentine retired to Affane, and for a period occupied himself as an active and influential country gentleman. He was made Clerk of the Peace for the County of Cork, a Register of Transplantation, and a Justice of the Peace. In the performance of the onerous duties which, in the then disturbed state of Ireland, these offices brought upon him, he gained deserved popularity and universal esteem. He was a frank and commanding personage, of pleasant manners, gallant bearing, fine figure, and singularly handsome face. With a hearty and musical voice, and a national stock of high animal spirits, he was the delight of all festive assemblies, taking his pleasure freely, but never to excess....

"On the Restoration, Valentine Greatrakes lost his offices, and was reduced to the position of mere private

gentleman. His estate at Affane was a small one, but he laboured in it with good results.... Perhaps he missed the excitement of public business, and his energies, deprived of the vent they had for many years enjoyed, preyed on his sensitive nature. Anyhow, he became the victim of his imagination, which, acting on a mind that had been educated in a school of spiritual earnestness and superstitious introspection, led him into a series of remarkable hallucinations. He first had fits of pensiveness and dejection, similar to those which tormented Cromwell ere his genius found for itself a more fit field for display than the management of a brewery and a few acres of marsh land. Ere long he had an impulse, or a strange persuasion in his own mind (of which he was not able to give any rational account to another), which did very frequently suggest to him that there was bestowed on him the gift of curing the King's Evil, which, for the extraordiness of it, he thought fit to conceal for some time, but at length communicated to his wife, and told her 'that he did verily believe that God had given him the blessing of curing the King's Evil, for whether he were in private or in publick, sleeping or waking, still he had the same impulse; but her reply was to him, that she conceived this was a strange imagination.' Such is his statement.

"Patients either afflicted with King's Evil, or presumed to be so, were in due course brought before him; and, on his touching them, they recovered. It may be here remarked that in the days when the Royal Touch was believed in as a cure for scrofula, the distinctions between strumous and other swellings were by no means ascertained, even by physicians of repute; and numbers of those who underwent the manipulation of Anointed Rulers were suffering only from aggravated boils and common festering sores, from which, as a matter of course, nature would in the space of a few weeks have relieved them. Doubtless many of Valentine's patients were suffering, not under scrofulous affections, but comparatively innocent tumours, for his cures were rapid, complete and numerous....

"Greatrakes himself also speaks of his more violent curative exertions making him very hot. But it was only occasionally that he had to labour so vehemently. His eye, the glance of which had a fascinating effect on people of a nervous organisation, and his fantastic ticklings, usually produced all the results required by his mode of treatment.

"The fame of the healer spread far and wide. Not only from the most secluded parts of Ireland, but from civilized England, the lame and blind, the deaf, the dumb, and diseased, made pilgrimage to the Squire of Affane. His stable, barn, and malt-house were crowded with wretches imploring his aid. The demands upon his time were so very many and great, that he set apart three days in the week for the reception of his patients; and on these days from six in the morning till six in the evening, he ministered to his wretched clients. He took no fee but gratitude on the part of those he benefited, and a cheering sense that he was fulfilling the commands of the founder of his religion. The Dean of Lismore cited him to appear before the ecclesiastical court, and render an account of his proceedings. He went, and on being asked if he had worked any cures, replied to the Court that they might come to his house and see. The judge asked if he had a license to practice from the Ordinary of the Diocese; and he replied that he knew of no law which prohibited any man from doing what good

he could to others. He was, however commanded by the Court not to lay his hands again on the sick, until he had obtained the Ordinary's license to do so. He obeyed for two days only, and went on more earnestly than ever."

Under the encouragement of high patronage, Greatrakes migrated to England, where he rapidly became a star of the first magnitude. "Lord Arlington commanded him to appear at Whitehall, and perform in his peculiar fashion for the amusement of His Majesty Charles II. . . . But the majority of his admirers were ladies, the Countess of Devonshire entertained him in her palace; and Lady Ranelagh frequently amused the guests at her routs with Mr. Valentine Greatrakes, who, in the character of the lion of the season, performed with wondrous results on the prettiest or most hysteric of the ladies present. It was held as certain by his intimate friends that the curative property which came from him was a subtle aura, effulgent, and of an exquisitely sweet smell, that could only be termed the Divine breath." Dr. Henry Stubbe, a famous physician, who practised in Stratford-upon-Avon, informs his readers that "God hath bestowed on Mr. Greaterick a peculiar temperament, or composed his body of some particular ferments, the effuvia whereof, being introduced sometimes by a light, sometimes by a violent friction, should restore the temperament of the debilitated parts, reinvigorate the blood, and dissipate all heterogeneous ferments out of the bodies of the diseased by the eyes, nose, mouth, hands, and feet. I place the gift of healing in the temperament or composure of his body, because I see it is necessary that he touch them. Besides, the Right Honourable the Lord Conway observed one morning, as he came into his Lordship's chamber, a smell strangely pleasant, as if it had been of sundry flowers; and demanding of his man what sweet water he had brought into the room, he answered, None; whereupon his Lordship smelled upon the hand of Mr. Greaterick, and found the fragrantcy to issue thence; and examining his bosom, he found the like scent there also." Dean Rust gave corresponding testimony, and "Sir Amos Meredith, who had been Mr. Greaterick's bed-fellow," also testifies to the same effect.

The Anglican career of our fellow-countryman was, however, not a prolonged one. His outshining brilliancy naturally made him hosts of enemies: Slander became too active; he was accused of profligacy and blasphemy, and what other vices his enemies thought would prove most damaging to his position in the public estimation. The tide of slander proved in this case irresistible, and Greatrakes retired before it to seek repose in his native country. It is not a little remarkable, however, that he succeeded in securing the confidence and patronage of the illustrious scientist, Boyle; and of the famous theologians, Wilkins, Patrick and Cudworth. In his *Memoirs of Remarkable Persons*, Caulfield gives a portrait of V. Greatrakes, Esq., engaged in stroking a

patient, and tells us that "Mr. Glanville imputed his cures to a sanative quality inherent in his constitution, some to friction, and others to the force of imagination in his patients." He further observes that "His manner of stroaking some women was said to be very different from his usual method of operation."

In a foot note, on the same page of Caulfield's work, we are informed that "In the reign of Charles I, an accusation was brought before the College of Physicians against one John Leverett, a gardener, who undertook to cure all diseases, but especially the King's Evil, 'by way of touching or stroaking with the hand.' He used to speak with great contempt of the royal touch, and grossly imposed upon numbers of credulous people. He asserted that he was the seventh son of a seventh son; and profanely stated that 'he found virtue go out of him,' so that he was more weakened by touching thirty or forty in a day, than if he had dug eight rods of ground. He also affirmed, that if he touched a woman, he was much more weakened than if he had touched a man. He was by the censor of the College adjudged an impostor."

Both these methods of treating the King's Evil have been recognized and practised among the peasantry of the West of Ireland. The direct application of the "Royal Touch" was, of course, out of the question. But a "knowledgeable" elderly woman was always within accessible distance, who possessed some of the "Royal blood and remains"—something mysteriously wrapped up in a linnen rag, with which the "Evil" was "touched" three times, "with certain prayers." The ceremony was performed on Mondays and Thursdays only; and no intervening Monday or Thursday could be allowed to elapse till the requisite number of (three) applications had been fulfilled.

The seventh son's touch was also applied on corresponding days, and with similar ceremony. It was usually efficacious; absolutely so, if the operator happened to be the seventh son of a seventh son; as in the case of Leverett, just cited. As the touch of the mere seventh son was not always infallible, it was considered desirable to test it immediately after birth, by filling the hand of the new-born infant with healthy earthworms. If a born healer, as such a boy usually was, the earthworms at once ceased to live! But I must add that the special therapeutic efficacy of the Monday-Thursday contact of the seventh son was usually employed against the "Ringworm"—not the "King's Evil."

The only herbal cure I ever heard of being used in the West of Ireland in the treatment of the King's Evil was that described at the opening of this paper.

I have now brought to a close my prolonged history of the blind struggle of the unenlightened past centuries with the non-exorcisable demon of the *King's Evil*. I feel that an apology—perhaps I should have said a great many apologies!—should be offered to my readers for in-

flicking upon their attention so very lengthy a catalogue of now forgotten or unrecognizable "remedies." Still I must take the liberty of suggesting that a cursory glance at the same can never prove uninteresting to the true lover of our profession, who is always conscious that he may not lose sight of its past any more than of its present; nor uninteresting to the philosophic student of human nature, who tries in all directions for the chinks and loopholes through which light has, at any period, penetrated into its arcana; nor ungratifying to the philanthropist, who examines with pleasure the sure, though often very slow, stages by which the means of relief have been discovered for the otherwise hopeless physical ills to which we all are born heirs, and if the smart, up-to-date, self-satisfied scientist feel disposed to turn away with contempt from the contemplation of the rubbish-heap of old-time "cures" and historic items of superstitious faith-healing which I have scraped together for his holiday edification—I would gently whisper in his ear that, even in the opening decade of our progressive twentieth century, the treatment of scrofulous disease still lies a long way on the human side of perfection; and that his supercilious self-congratulation in looking over the extracts from my scrap-book will probably be fully paralleled in the outlines of thought of the advanced "professor" of the year A. D. 2005, when glancing backwards at the history of the creed of the bacteriologic pathologist of today, with its characteristic outgrowths of tuberculin and antitoxin.

DIGEST OF MEDICAL LITERATURE

GENERAL SURGERY.

J. CHALMERS DA COSTA
JOHN H. JOPSON LAWRENCE HENDEE
J. COLES BRICK JOHN W. CHURCHMAN

GUNSHOT WOUNDS OF THE LIVER.

BY

CHARLES GREENE CUMSTON, M.D.,

of Boston, Mass.

Quite recently the question has been discussed as to whether or not the former practice of immediate laparotomy, followed by careful gauze plugging, is the best method in penetrating wounds of the liver in military or civil practice. This subject has been considered more particularly on account of the excellent reports relating to wounds of the abdominal viscera which have been published since the South African war, and it would appear at first sight that the conservative method has proved the best, particularly so because the injured in this war had to be transported by railroad for some distance. But whether or not the wounded, before receiving any medical attendance, have to undergo an easy and short, or a long and difficult, transportation appears to be the most important factor in the minds of the surgeons acting in the Transvaal war relative to their decision in undertaking or discarding immediate surgical

interference, and this is especially so as far as Treves and McCormack are concerned. The former (*British Med. Journal*, May, 1900) excludes all cases of injuries to the liver from those operated upon immediately after action, thus admitting the danger of the operation and the impossibility of maintaining absolute asepsis so necessary in abdominal operations and so difficult to obtain on the battlefield. McCormack (*Lancet*, March, 1900) made the statement that it was a hopeless task to interfere surgically in serious injuries under these circumstances, and beside, it entails a considerable waste of time. On the other hand, slighter injuries are of such a nature that after being dressed and left to themselves make excellent recoveries. Treves (*British Med. Journal*, 1900) relates the case of an officer whose liver and right kidney were penetrated by a bullet, and without operation he made an excellent recovery.

That such fortunate outcomes are not very common would seem evident if one takes into consideration the report given by Kuttner (*Münch. med. Wochenschrift*, 1900) from Jacobsdal. The statement is practically made that all cases of gunshot wounds of the liver die on the battlefield, and this pessimistic outlook is hardly at all modified in a later report from the same surgeon, who states that a few have escaped with their lives (*Beitr. zur klin. Chirurgie*, 1900).

Undoubtedly more favorable results in cases of gunshot wounds of the liver are obtained in civil practice, for the simple reason that the patients are immediately subjected to surgical care, and in those instances where this is impossible they can at least have their wounds properly dressed and placed on a strict diet and absolute rest, both of which are important factors in conservative treatment.

The frequency of open wounds of the liver is hardly less than the subcutaneous injuries of the organ, even in times of peace, and Langenbuch has shown that the former represented 50.8% and the latter 49.2%; that in the open wounds 17.2% were inflicted by pointed instruments and that 32% were gunshot injuries. These statistics, which were based on 362 cases, were recorded in Edler's work, which appeared in 1887 (*Emden, Dissertation*, Kiel, 1903). Out of a total of 543 cases there were 180 recoveries. These include the liver injuries received in the Civil war, but Langenbuch omits these, because of the preponderance of bullet wounds. Edler found that 34.8% were subcutaneous injuries of the liver and 65% were open wounds; 53.2% of the latter were gunshot injuries of the liver. In civil practice gunshot injuries represent 33.3% of all lesions of the liver. This can readily be understood, because many accidents occur, such as unskilful management of guns and pistols, attempts at suicide, etc., while in war there are injuries of various kinds resulting from bullets of various calibers. Formerly the Mauser gun had a caliber of 11 mm., while in the modern gun (*Stahlmantelgeschoss* of the Germans) the caliber has been reduced to about 6.5 mm.; then again there are liver injuries from projectiles of large caliber, although in far less frequency.

There are anatomical and physiological reasons for the relative frequency of gunshot injuries of the liver and also for their danger. First, it is the largest gland

of the body, and in opposition to almost all other glands, it has no adequate external protection which other organs of equal importance possess. The lower part of the right, and almost the entire left lobe, lie directly under the abdominal wall and this is the only protection given the organ, and when the missile comes from a considerable distance it has lost its power of penetration; or, if on the other hand, it still retains some force, it may pass through the abdominal wall and merely penetrate the capsule of the liver. Firmly held by inelastic ligaments in the angle formed by the diaphragm and the right thoracic wall, the liver is not in position to escape from injury and at the same time it does not offer any protection to the neighboring organs; in reality, on account of soft consistency it is more apt to favor the penetration of the missile into other viscera.

The hepatic lobules are separated by connective tissue, which serve as the support for the vessels of the portal system, and this, together with the parenchyma and the highly developed capillary system, makes the liver the largest blood-containing organ of the body. Its close proximity to the diaphragm and lower part of the thorax causes the blood-pressure to be dependent upon the respiratory apparatus and the steady vibration caused by this blood-pressure is favorable for the arrest of hemorrhage in the organ, although this factor is more than insignificant when compared with the congestion of the organ regularly occurring after digestion has taken place. Von Podwyssozki (quoted by Emden, loc. cit.) has experimentally proved that the liver of animals previously subjected to starvation for a couple of days is anemic, and that when this organ is excised there is a very trifling loss of blood. On the other hand, it has been shown by Terrier and Auvray (*Revue de Chirurgie*, 1896 and 1897) that during the process of digestion the bloodvessels become enormously overdistended, and this corresponds with the actual practical results revealed on the battlefield, where abdominal gunshot injuries produce considerably less hemorrhage when they are received after the period of digestion is over.

These are the unfavorable conditions presented by the liver on account of its anatomical position and functions. The evolution of the traumatism and its results will depend entirely upon the extent of the injury, the tendency of the process of repair, but, above all, the serious complications which may develop. Projectiles at short range appear to produce injuries which are recovered from about as well as those where the traumatism results from a shot fired at a long distance; and in the Boer war, Sthamer, (*Münch. med. Wochenschrift*, 1901) met with cases of long-distance shots made by bullets of small caliber, which recovered in eight to fourteen days.

Naturally, the position of the subject at the time the shot is received will directly influence the course of the bullet. In the erect position the bullet will go through the abdominal walls and enter the liver directly. In the days when operations were not resorted to in these injuries, surgeons directly reached the wound in the liver by the use of probes and so forth, and Nauwerk, in describing a fortunate result in a case of gunshot injury of the liver, points out that after the track caused by the bullet was cleaned out, the missile could be seen deep down in

the parenchyma of the liver. However, at the present time, it is considered better from the point of view of the prognosis if the injury is received while the subject is bending over. When this is the case the abdominal wall is drawn directly over the opening into the peritoneum, and thus prevents, at least for the time being, all communication with the outside.

With the modern infantry tactics of advancing from point to point, searching for cover and remaining there, either kneeling or bent over, many abdominal lesions will naturally be inflicted in these attitudes. Beck has described a case where the bullet entered the liver after it had caused a fracture of the arm and still more interesting is a case recorded by Nussbaum, where this organ was injured after it had gone through one side of the face and shattered it. (Quoted by Emden, loc. cit.) On the other hand, neighboring organs may be injured by missiles which have, in the first place, gone through the liver.

The position of the body at the time the bullet is received is consequently of considerable importance as far as its course is concerned, but it is of the greatest significance when its influence upon the hepatic parenchyma is considered. The extent of the traumatism caused by the bullet will naturally depend, above all upon the distance that it has to travel. In shots fired at close range, a condition more frequently met with in civil than in military surgery, entire lobes of the organ may be destroyed, a very striking example of which has been recorded by L. Mayer. (Quoted by Emden, loc. cit.) By direct application of the pistol in the hepatic region, the entire liver was changed into a pulpy mass, with the exception of Spiegel's lobe. Such occurrences do not take place if there exists only a very short distance between the body and the muzzle of the weapon. In a case reported by Emden the distance was about .5 meter, and, in another described by Lediard (*Schmidt's Jahrbuch*, Bd. 221) it was practically 1 meter, and, nevertheless, in both there was but slight destruction of the liver substance. The magnitude of the resulting lesion certainly depends upon the penetrating power of the missile. Bullets coming from some distance usually produce a track with more or less smooth walls. If the neighborhood of the track has been torn, a stellate appearance is given to the traumatism. The track of the bullet will either terminate in the parenchyma, which naturally will then retain the bullet, or it traverses the liver substance. Such tracks may have a diameter of from 1.5 to 8 cm., according to the amount of the impetus.

If a bullet penetrates the liver so that an opening of entrance and exit is present, large pieces of hepatic tissue may be eliminated, or washed out during irrigation of the wound, as was formerly done. In one case Volkmann removed by irrigation two pieces of liver substance having smooth surfaces and sharply-cut borders; he compared them to bone splinters, which are thrown off in gunshot fractures. Such elimination of substance can certainly only be met with in a hard and friable tissue. The soft hepatic parenchyma composing the normal gland has little resistance, and is the seat of the so-called complications of gunshot wounds. Generally speaking, the destruction is all the greater, the softer be

the parts involved in the traumatism. The liver suffers from contusion in all its parts when any portion of it has received an injury. Beside the principal lesion there exist numerous minute ones which are only microscopically noticeable and represent destructive or hemorrhagic processes. They are not remarked at first, because they give rise to no symptoms, and they serve as favorable points of attack in any subsequent disease, because they form just so many points of lessened resistance. This is why the prognosis is never good with any degree of certainty, even if the lesion undergoes repair.

If liver cells or fatty tissue are introduced into the general circulation by the action of the missile, an embolus in the pulmonary circulation may arise, a condition which is quite as rare as it is dangerous. The loss of substance which the organ suffers when bits of it are torn off is of little importance, because this loss does not impair the functional activity of the organ, or if it does it is only for a very short time. This has been experimentally proven by Ponfick and upon the operating table, by Langenbuch. The former (*Virchow's Archiv.* Bd. 119, 1890) removed the entire liver in one animal, which resulted in death; in another he removed three-fourths of the organ without noting any functional disorders, and it was found a short time afterward that the liver substance had regenerated to quite an extent. Langenbuch resected a portion of the liver amounting to about one-quarter of the organ without inconvenience to the patient.

The regeneration of liver tissue has been studied by Ponfick, and later on this phenomenon was explained by Meister (*Ziegler's Beitr.*, Bd. 15) and de Dary (*Dissertation*, Freiburg, 1897) as being due to extensive compensatory hypertrophy of the remaining structure, which has been noted in injuries of the liver and kidney. While the secreting liver cells take part in the process of compensation, the real restitution of the organ is accomplished by the lower order of tissue elements, namely, the interstitial connective tissue and the ducts.

The great dangers of injuries are due, first of all, to the large number of complications which may arise and make the ultimate outcome of gunshot injuries of this organ an uncertain problem. First of all is the danger of death from hemorrhage, and after this, that of infection. The unfavorable conditions for controlling the hemorrhage have already been referred to, and result from the direct control of the respiration over the blood-pressure and the unequal distribution of blood in the organ at different periods of digestion. The severity of the hemorrhage will also depend upon the part of the liver involved, whether it has been received upon the concave or the convex aspect of the organ. On the concave aspect will be found the bile ducts and bloodvessels, which if injured are very apt to result in death.

Death from hemorrhage may even result when the latter is capillary, and Zeidler's (*Deutsche med. Woch.*, 1894) writings prove with what extreme caution small hemorrhages of the liver must be treated. An autopsy made by Küttner on the battlefield on a patient who died from hemorrhage resulting from a gunshot wound of the liver also proves the great danger from this cause. If the hemorrhage is small, a condition frequently ob-

served, and can give rise to serious conditions, all the greater will be those injuries resulting in the leakage of bile and the three varieties of blood circulating in the liver when they inundate the abdominal cavity. In the first place, such a heterogenous fluid irritates the peritoneum mechanically and sooner or later may lead to a serofibrinous inflammation; or, on the other hand, the fluid may be the means of directly carrying the bacteria of infection into the peritoneum. Endogenous and exogenous causes may produce infection; the direct communication of the wound with the exterior, the introduction of bits of clothing or dirt into the bullet tract were formerly considered as sources of infection, but the bullet itself is at the present time generally admitted to be aseptic. Many authorities (König, *Berliner klin. Woch.*, 1900) have upheld that the liver tissue was the source of infection and it is probable that there is no more impure blood in the body than that contained in the portal vein. If this be infectious, the germs can enter the veins of the liver after going through the capillaries of the portal vein; bacteria, such as the colon bacillus, may enter the bile ducts from the duodenum and thus infect the liver, and Gilbert (*Centralbl. für Pathologie*, 1894) was able to cause an infectious process in this organ by injecting bacteria into the bile ducts by way of the intestine.

The dangers of infection are especially great as far as the liver is concerned, because the bacteria find an excellent soil for their development in the broken-down liver cells, resulting from the action of the missile and this process can later on develop into an acute inflammatory one which may be considered traumatic. The evolution of the process, either in repair, or abscess transformation with possible rupture into the surrounding peritoneum, or in favorable cases, into the intestine, or through the abdominal wall, should always be borne in mind when making a prognosis in gunshot wounds of the liver, even after the patient has escaped death from hemorrhage or peritonitis. Of great importance is the recognition of symptoms resulting from injuries to the liver, although no great difficulty is present where the entrance of the missile lies in the normal position of the gland, but when the bullet has entered at some part of the body distant from the liver other diagnostic elements are required; in such cases the injury is usually a complicated one, but the entrance can, for example, be found on the left side of the abdomen and still the liver will be the only organ injured. This is due to the fact that the openings in the gut close very rapidly. The first symptom of an abdominal hemorrhage is a rapidly developing anemia, while the symptoms of shock, which usually appear at once in cases of subcutaneous injuries of the liver, rarely arise when this organ is the seat of gunshot wounds. The patients frequently walk a considerable distance before giving up. Vomiting usually comes on soon after the receipt of the injury and is due to the entrance of the bile into the stomach from the sudden irritation of the liver; it may also represent the first symptom of peritoneal irritation. Along with this occur great abdominal tenderness and rigidity of the abdominal walls. If one is dealing with a wound of the liver, the presence of blood in the vomitus is an im-

portant indication that other organs are also injured, while blood in the stools would point to the possibility of intestinal lesions.

A very important symptom is pain in the region of the shoulder and this applies to a great many pathologic conditions of the liver. It can be explained by reflex action upon the nerve supply of the shoulder, because the latter has a common origin with the phrenic from the anterior branch of the fourth cervical; the phrenic supplies Glisson's capsule and the reflex action from the liver thus results.

Jaundice is less frequent than might be supposed, and out of 61 gunshot injuries of the liver, Mayer only met with this symptom in 11 instances. In the days when operations were not resorted to in these cases, it would seem that there should have been more instances of icterus, this being favored by the absorption of the blood exudate mixed with bile. Verneuil has reported an instance of long-standing icterus in a gunshot injury to the liver; the right lobe was involved and the jaundice appeared on the fourth day following the injury, attained its maximum on the tenth day; after that it slowly disappeared. If this symptom appears early it must be regarded as resorption icterus; if secondary, that is to say, when it appears a fortnight or so after the injury, it usually indicates an obstruction to the bile, which naturally implies some complication in the bile ducts. The urine will be found to contain a considerable amount of biliary coloring matter, but sugar has only been found in one case by Edler.

A few years ago certain French authorities drew attention to the increase of urobilin in the urine, which they considered as another symptom of a hepatic lesion. In this respect we must dissent, because we are inclined to believe that its presence would only point to the existence of an intraabdominal effusion of blood from any organ whatsoever, for the simple reason that urobilin will be present in great quantities in all cases where large amounts of blood are absorbed, because it is a hydrate of bilirubin.

Enlargement of the liver soon after the injury has been received is infrequent, although such instances have been reported, but the presence of this symptom will usually have to be left undetermined, on account of the considerable abdominal tenderness present in these cases.

Operative Treatment of Bone Tuberculosis.—C. F. Painter (American Journal of Orthopedic Surgery, July, 1905), believes there is a very definite field for radical surgery in tuberculous disease, and that there would be a great deal less need of surgery if tuberculosis in the bones were treated as tuberculosis and not simply as joint disease, if the patients were given the benefit of nature's restorative measures. Joints infected in childhood, which relapse in adult life, yield the best results if ankylosis can be secured in good position. If motion is present together with deformity, deformity should be corrected, provided there are as many as 25% of motion; if less than this, and deformity exists, deformity should be corrected and ankylosis secured at the same time. If deformity is present with ankylosis, ankylosis should be left alone and deformity overcome. If motion without deformity is present, and this motion is less than 25%, it is safer to secure ankylosis, as irritation of so

few degrees of motion tends to stir up latent disease. This would not be called for, of course, unless there were symptoms of oft-repeated joint strain or active disease. [H.M.]

Kidney Injuries.—Habs (Münchener medizinische Wochenschrift, 1905, lii, 602) differentiates between three different varieties of kidney injuries: (1) Superficial contusions; (2) lacerations reaching into the kidney substance; demolition of kidney tissue; (3) tearing away of renal vessels, ureter, or hilus. The first manifests itself as perineal hematoma, pain over the kidney region, a palpable mass, little or no blood in the urine, oliguria. In the second group we have abdominal hematoma and hematuria. The third group usually leads to death very rapidly. The second and third groups are often associated with injury to other abdominal organs, and in all three groups are noted initial shock, collapse, and local pain. The latter is characteristic, in that it gradually increases during the first hours, due to increasing infiltration with blood and urine; it radiates along the loins to scrotum, penis, and thighs. Renal hematuria is recognized by the regularity of the blood stain in the urine; in vesical hematuria the last urine is stained deeper than the first. Ureteral blood-casts are discharged in renal hematuria. Oliguria is an early symptom and extends to anuria at such times, when through reflex shock the other kidney ceases to functionate; such cases terminate fatally, due to uremia. Determination of the freezing-point shows whether the oliguria is true or not. Lastly, he describes a case of kidney rupture, in which both oliguria and hematuria were missing, and yet a kidney injury was diagnosed. The man struck his left side against a coupler and at once experienced the radiating pains described above; tenderness existed over the kidney region, but no mass could be made out. The urine was always normal. The abdominal muscles of the left side were rigid, but not those of the right. The quantity of urine voided was but little diminished. He recovered perfectly. The type of injury, of pain, of localized tenderness and rigidity, mark the case one of superficial kidney laceration. Habs treats his patients symptomatically: Rest, low position of head, morphin, ice-bag, ergotin, gelatin; if the laceration threatens life, an operation. [E.L.]

Fixation Instead of Transplantation of Tendons.—Tilanus (Il Policlinico, Rome, No. 67, 1904), of Amsterdam, reports 8 cases. When the old operation is found impracticable, he splits the tendon and fixes one set of fibers to the periosteum and bone. The plastic procedure has been successful in restoring function in cases of great motor incapability. Details are given. [T.H.E.]

Diagnostic Value of Tuberculin in Orthopedic Surgery.—W. S. Baer and H. W. Kennard (Johns Hopkins Hospital Bulletin, 1905, xvi, 13, No. 1) employed the tuberculin test in 40 patients afflicted with diseases of the skeleton. The cases were selected almost invariably to clear up the diagnosis. A positive reaction was obtained in 25, a negative in 15. Six of these 25 patients were subsequently operated on and found to be tuberculous; in 18 the diagnosis was subsequently verified by the history and response to antituberculous treatment. The twenty-fifth case is of such recent date that the history is not yet available. Of the 15 negative results 1 was proved so by operation, 8 by recovery under nontuberculous treatment; the remaining 6 are improved and all suspicion of tuberculosis has disappeared. Fifteen of the 25 positive cases were radiographed; 6 showed a focus, in 5 the disease was suspected only, in 4 no lesion was discovered. After discussing the method of employment, the symptoms of a reaction and the value of the tuberculin from the therapeutic standpoint, the authors record the following conclusions: Tuberculin is the best and most reliable diagnostic agent for incipient tuberculosis of bones and joints. Its proper administration is attended by no permanent harmful effects. The dosage is variable, but it is rarely necessary to exceed a

dose of 6 mg. The local signs are of equal, if not greater importance than the general reaction in bone and joint tuberculosis. Tuberculosis practically always reacts to tuberculin. Diseases other than tuberculosis may possibly react to tuberculin, but the evidence on this point is not conclusive. The diagnosis of tuberculosis can be made earlier and of more certainty by means of tuberculin than by radiography. The tuberculin test is applicable to private and dispensary as well as to hospital practice. [E.L.]

Nonoperative Treatment of Ankylosed Joints.—J. T. Rugh (International Clinics, Vol. ii, Fourteenth Series, 1904) says the surgeon must determine the following points before he can advisedly institute treatment in a case of ankylosis: (1) The cause; (2) the duration; (3) the variety. Ankyloses are of two kinds, fibrous and bony. In the latter the treatment is necessarily operative. The cases amenable to manipulations, massage, mechanical devices, or similar agents are those of fibrous ankylosis, contractures, and contractions. Methods of interference are the slow and rapid. When the lesion is extraarticular the slow method is preferable, but when the joint surfaces are involved to any extent rapid correction must be employed. After describing the various methods under each group, Rugh says the keynote of the treatment of all these cases is constant attention to the case and unrelenting persistency in following up the results that may have been gained from day to day, week to week, or month to month. The physician to attain success must have endless patience, a complete assurance to impart confidence to his patient, and unerring judgment to know when sufficient has been done at each time of treatment. Rugh has tabulated the manners of holding or fixing a part during manipulation that have proved most satisfactory in his experience as masseur and as surgeon. These are given in detail, and are accompanied by 22 excellent illustrative photographs. [A.G.E.]

Osteotomy in Angular Ankylosis of the Hip-joint.—F. Mueller (Chicago Medical Recorder, July 15, 1904) discusses the various open surgical methods applicable to ankylosis of the hip-joint in an endeavor to point out which is most expedient in the individual case. Osteotomies may be divided into those which incise centrally and those which incise distally from the trochanter. The former includes central osteotomy of the femur neck and pelvitrochanteric osteotomy; the latter represents all the subtrochanteric methods. Points influencing the choice of method are the certainty of securing solid union, technical difficulties, correction of the deformity with the least interference with the skeleton and length of the bone, and the relative agreeableness to the patient. In general, correction will be best when the line of osteotomy falls into the vertex of the deformity present; when the femur head is present this requirement is practically attained by central osteotomy of the femur neck and demonstrates its superiority over the subtrochanteric method. When the femoral head and neck have partially disappeared, the osteotomy line runs through the point of meeting of the pelvis and stump of the femur, pelvitrochanteric osteotomy. On the contrary, in cases of distinct abduction ankylosis subtrochanteric osteotomy is the operation of choice and should be performed as high up as possible; this is necessary to overcome the resistance of the gluteal muscles. Very much depends on the retention apparatus, casts being preferable to bandages. [A.G.E.]

Scoliosis in Sciatica.—H. Ehret (Mitteilungen aus den Grenzgebieten der Medizin und Chirurgie, 1904, Vol. xiii, p. 110) finds scoliosis after sciatica very common and traces it to the very beginning of the disease. When the patient is first put to bed, he will place his limb and pelvis into that position which will give the sciatic nerve the greatest amount of ease. The limb is abducted, flexed at hip and knee, and rotated outward. The patient usually retains this position when he leaves

his bed, and to enable him to walk well with an abducted limb, the pelvis must of necessity be depressed; this produces the scoliosis. Five typical cases are reported. Ehret states that scoliosis exists in from 75% to 80% of the cases. The concavity of the scoliosis is usually directed toward the well side; when the lumbar plexus is implicated, toward the diseased side. To ease the pain of a chronic sciatica, the sole of the good limb may be elevated, thus giving the other limb a better chance to abduct; this, however, will at the same time favor the scoliotic development. After the sciatica has disappeared the scoliosis will be markedly improved by raising the shoe of the diseased side. Ehret has cured a scoliosis of 4½ years' standing in 18 months by raising the sole of the shoe of the affected side 3 cm. [E.L.]

DERMATOLOGY

M. B. HARTZELL.

RECENT OBSERVATIONS IN RADIOTHERAPY.

BY

S. H. BROWN, M.D.

Common and conflicting as the reports are of the value of the röntgen ray in the treatment of cutaneous and allied affections, yet we occasionally encounter records that are of more than passing interest. This is especially true of the recent paper by H. B. Wilkinson, physician in charge San Lazars Hospital, Manila, P. I. (Journal of the American Medical Association, February 3, 1906). It has been this investigator's good fortune to have an abundance of material for the study of leprosy and for the observation of the effect upon this disease of the various therapeutic measures recently devised.

Of the 239 cases reported, 97 were hypertrophic, 47 atrophic, 92 mixed, and 8 undetermined, one of the latter being probably atrophic and two not leprosy at all, but lupus vulgaris. In the entire number of patients the disease had existed to an extent to be recognized for an average period of 8.11 years, and the average period of their residence in this hospital had been 2.55 years. Seventy-seven of the patients had had the disease for 10 or more years, 12 for 20 or more years, 1 for 31 years, and 1 for 41 years. Seven patients had been in this hospital for 10 or more years, 2 for 17 years, and 1 for 18 years. Of the 47 atrophic cases he found that the average time during which the patients had been known to have had the disease had been 12.28 years, while the average time in this hospital had been 4 years.

The average estimated disability or deformity for the entire 239 cases was 53%; 12 patients showed no disability; 96 showed less than 50% disability; 37 showed 50% disability and 94 showed more than 50% disability.

The average vitality of the entire number was estimated at 68%. There were 5 patients with 100% vitality, or practically normal; 158 with more than 50%; 56 with 50%; and 20 with less than 50% vitality.

On microscopic examination of scrapings from the leprotic lesions he found 193 positive for the lepra bacilli by the first slide taken and 46 negative. Subsequently he made three slides from each of these 46 negative cases and found 20 of them positive, there remaining 26 permanently negative for lepra bacilli in scrapings from the skin. He made numerous subsequent examinations of these negative cases and continued to find

them negative, but in a few patients who have since died, he was able to demonstrate the bacilli in nerves which supply the atrophied regions of the body. It is interesting to note that all of these 26 permanently negative cases belong to the atrophic variety, except 3. One of these 3 was classed as doubtful, but he was inclined to class it as atrophic, while the other 2 were probably lupus.

Below will be found a tabulated list of 13 patients treated during the last year. All these patients had been natives of the Philippines, and are numbered from 1 to 13 for easy reference.

No.	Sex.	Age.	Duration of Disease in Years.	Number of Treatments.	Date of Treatment.	Result.
1	F.	15	9	44	Jan. 31, 1904..	Not improved
2	M.	8	1	18	Jan. 23, 1905.	
3	M.	8	5	11	Apr. 23, 1904.	
4	F.	10	3	12	Nov. 21, 1904.	Improved
5	M.	87	1	14	Apr. 23, 1904.	Not improved
6	F.	12	5	40	Nov. 21, 1904.	
7	F.	14	4	37	Apr. 23, 1904.	
8	M.	13	4	38	Sept. 8, 1904..	Cured
9	F.	12	7	14	Sept. 10, 1904.	Improved
10	M.	16	5	12	Feb. 1, 1905...	
11	M.	36	18	15	Sept. 10, 1904.	
12	M.	19	2	52	Jan. 23, 1905.	Improved
13	M.	25	2	14	Sept. 10, 1904.	
					Jan. 23, 1905.	
					Oct. 25, 1904..	Improved
					Jan. 23, 1905.	Improved
					Oct. 27, 1904..	
					Jan. 20, 1905.	
					Oct. 27, 1905..	Improved
					Jan. 17, 1905.	Cured
					Jan. 9, 1905...	
					June 7, 1905...	
					May 8, 1905...	Cured
					June 7, 1905..	

As will be seen by an examination of the table, 3 patients have been cured, 7 improved, and 3 not improved.

Wilkinson is inclined to believe that the cure of the local lesion of leprosy by the röntgen ray is brought about by the destruction of the bacilli and their subsequent absorption by the system, thereby producing an immunity against the living organisms.

Another contribution worthy of mention is that of Leredde and Martial (*Revue pratiqu. des Malad. cutan.*, 1905, 8) concerning the favorable influence of the röntgen ray upon three cases of eczema. Their results were uniformly good. They state, however, that the proper cases for this mode of therapy are those in which other plans of treatment have failed. By proper dosage no ill effects should occur. The itching is relieved in all cases, according to their experience. They do not repeat the exposure more than once in a fortnight, and measure the dose by the standard of Holzkmnecht, seldom using more than two units.

F. Wise (*Medical Record*, January 20, 1906), in reviewing the röntgen-ray work of the New York Skin and Cancer Hospital, reaches conclusions that seem to be in accord with those of most of the observers at the present time. These may be quoted:

"1. The röntgen ray will cure ringworm and favus of the hairy skin more rapidly and reliably than any other method of treatment; the advantages of the method are, that it is painless, harmless when properly used, and thorough, and that it cuts down the expense incurred by the city in the treatment and care of these patients to a very considerable extent.

"2. Hypertrichosis should be treated with electrolysis, not with the röntgen ray.

"3. The röntgen ray gives very satisfactory results in the various forms of cutaneous tuberculosis; in keloid, in keratoses, in infiltrated patches of chronic eczema, lichen planus, pityriasis rubra; in the tubercles, ulcers, and tumor masses of mycosis fungoides, psorospermiosis and sarcoma.

"4. Röntgen radiation relieves pruritus, burning, tingling, and pain; it decreases the discharge and foul odors of various dermatoses, often causing them to disappear completely.

"5. In selected cases, radiotherapy is the ideal agent in the treatment of epithelioma and rodent ulcer."

A very interesting feature of röntgen-ray therapy is the development of carcinoma upon the site of a röntgen-ray burn. This has been recorded by Mendes Da Costa (*La Revue Pratique des Mal. Cut. Syph. et Neu.*, 1905, p. 224) in seven cases of lupus subjected to prolonged treatment. He considers, however, that possibly lupus predisposes the skin to epitheliomatous changes since he observed no like phenomena in his other cases. He also thinks the treatment is contraindicated in diseases which demand a number of seances, on account of the atrophy of the skin induced.

The results of röntgen-ray treatment in ringworm of the scalp have perhaps attracted more attention than in other diseases recently, possibly on account of their uniformity. MacLeod, of London (*British Medical Journal*, July 1, 1905), treated 60 cases of the small-spored variety with marked success. W. C. Oram observed 50 cases with like results. In 17 cases under the observation of F. Wise, apparent cure was readily obtained. The curative process is believed to be due to the depilation produced.

A new ray filter has been devised by Pfahler (*Archives of Physiological Therapy*, November, 1905), consisting of a disc of sole leather five inches in diameter; or if the hard rays are to be removed a disc of pure silver may be used. The leather is soaked in water before being used. Being so prepared it resembles the human integument in so far as it selects and absorbs the rays that have the injurious effect upon the skin.

BOOKS RECEIVED.

[Prompt acknowledgment of books received will be made in this column, and from time to time critical reviews will be made of those of interest to our readers.]

Baby Incubators.—By JOHN ZAHORSKY, A.B., M.D., Clinical Professor of Pediatrics, Medical Department of Washington University, St. Louis. Reprinted from a series of articles in the *St. Louis Courier of Medicine*, 1905. Courier of Medicine Company, St. Louis, 1905.

Lectures on Auto-intoxication in Disease, or Self-poisoning of the Individual.—By CH. BOUCHARD, Professor of Pathology and Therapeutics; Member of the Academy of Medicine and Physician to the Hospitals, Paris. Translated, with a preface and new chapters added, by THOMAS OLIVER, M.A., M.D., F.R.C.P., Professor of Physiology, University of Durham; Physician to the Royal Infirmary, New Castle-upon-Tyne; formerly Examiner in Medicine, Royal College of Physicians, London. Second revised edition. Crown octavo, 342 pages, extra cloth. Price, \$2.00 net. F. A. Davis Company, Philadelphia, 1905.

A Study in Nursing.—By Miss A. L. PRINGLE, formerly Matron of St. Thomas' Hospital; Superintendent of the Nightingale Training School for Nurses, etc. Macmillan & Co., New York and London, 1905.

Treatise on Diseases of Children.—By DR. JOHN MARSON TAYLOR and DR. WILLIAM H. WELLS. Italian edition P. Blakiston's Son & Co., Philadelphia, 1905.

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